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Memory

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Expansion

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IO

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Intel 486EX Chipset, 66MHz/83MHz Main-board

Processor

Intel Celeron Pentium® 233-550MHz, CPU
Multiplier 3.0x to 6.0x, CPU clock 33 to 100MHz

Memory

2 SDRAM sockets, support E - 256KB SDRAM

Expansion

1 AGP 3.0 PG and 3 ISA (1 shared)

IO

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Welcome**



Behind this superior sense of smell

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enhancing the dog's legendary sense of smell

Most of us are pretty blasé about the concept of wide-area networks these days.

The basic idea of massive networks is fairly well understood: businesses and private citizens need to be able to communicate effectively and instantaneously with colleagues, partners and customers around the world.

But what about visitors from other planets?

It appears we're supposed to network with them too! Honestly, that's the principle behind the sciPhonic program associated with The SETI Institute in Mountain View, Calif., an organization focused primarily on answering the question: "Are we alone in the universe?" (SETI stands for search for extraterrestrial intelligence.) As we know from movies like *Close Encounters*, *Star Trek*, *Twelve Monkeys* and a compelling space-science organization like The SETI Institute are collecting electronic signals of space-faring, mostly as incoming radio waves. The challenge is to look for repeating patterns among the static, via computer processing. Sadly, there appears to be insufficient computing resources available to the space researchers. Hence, sciPhonic wants to create a giant network of PCs to help crunch the data.

If you want to participate in the search for extra-terrestrials, visit <http://databases.setihome.org/terrestrial/>. The idea is a participant can download a screen-saver-like piece of software that will process a small amount of data when the computer's resources aren't in use. Then, when the next contacts appear in the Internet, the information will be sent back to the project, and a new chunk of data will be sent out to the participating PC. The software, according to the Web site, "searches for strong signals at four million different combinations of frequency, bandwidth, and chirp-rate drift in frequency with time."

The project is optimistically hoping for "hundreds of thousands" of participants, in an enormous distributed computing effort. Sun Microsystems is listed as one of the key sponsors. (The universe is the computer!)

CRTC-Controlled Interfaces

Regarding networks closer to home, the CRTC is accepting submissions from the public on "new media." (Visit http://www.crtc.gc.ca/eng/COMCASTING/NOTICE/000000/P0002_0.TXT to see the official document.) One of the big concerns about the industry is the potential for government-imposed



Alien Interfaces?

regulation on Internet Service Providers. ISPs argue such measures would add cost and diminish their competitiveness on a world stage.

Moreover, industry leaders such as Marco Langford, chairman of the Canadian Association of Internet Service Providers (CAISP), says any regulation of the industry needs to be done on an international basis so that ISPs

across the nation are dealing with the same sort of rules.

Human Interfaces

Of interest, in a recent discussion Bill Jones, vice-president of sales for Mornet Canada, said early about five per cent of orders to that distribution company are actually processed through the Internet, although the Web site is commonly referenced for informational purposes. "There's a demand for a human interface," said Jones. He said visitors want to be able to negotiate with a sales rep and feel they've achieved a "win" in doing the deal. "There's something to think about with your own customers — do they feel they're getting a "win" when they do business with you?"

This Issue

At *Canadian Computer Wholesaler* — while we're of course interested in the potential of alien computing environments — we're most concerned about the realities of your current markets. This month, look for a review of laser printers, under the direction of Lab Test Editor Sean Carruthers, for our recommendations of the best choices in that product category for the money ("Laser Printer: Speed and Quality Priced to Please," page 28).

As well, on the components front, we Part II of our Motherboard feature by Glenn Babin: "Re-Discover the 600MHz Motherboards," page 36. And for the latest news in sound technology, check out a special feature by Jeff Evans called "New Music First," page 40.

Meanwhile, I was fairly installing something Marco Langford and recently that struck me as humorous, but true: "The Internet doesn't really exist." She concluded: "It's just a way computers communicate with each other."

She didn't get quite there. ☹

Guy Courchesne
Editor

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Enough reversed text!

Our first reviewer, Canadian Computer Wholesaler, Mike, says he find the contents useful, we unfortunately display the amount of reversed text used in the magazine.

In the August issue, the table of contents is nearly readable except for the authors' names. Page 16 is hard on the eyes. Page 20 has glaring contrasts in white on red and hard to read black on red. Pages 24 and 25 are hard on my eyes. Page 30 is okay. Pages 36, 37 and 32 remind me of toiler without the bunny and pages 51 and 52 are difficult to read. Page 58 is also difficult to read. Could the better be made use of elsewhere?

If you must continue to use all these strange color schemes I suggest you either increase the font size of the text, or put it in boxes in normal black and white. Your August issue is being considered as an example of how not to do things for our local QTP sig.

Terence P. Miskow
President
SHARCUS
Naperville, Ill.
10270-2574Qtpsig@net.net

Quotable:

"Graphics are about a lot more than games. OpenGL is in your life every single day. It is like the air you breathe."

—Michael Geller, OpenGL product manager for Silicon Graphics Inc.



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Vain if Apple criticizes, new target Microsoft

I read Alie Damers article: "It's the OS PowerPC 'bore as hell'" (CW, last, page 98), and one of the apologetes for a good review of this issue. You have accurately exposed a claim that Apple has taken.

That is great! But that doesn't happen with Microsoft's products more often.

At any rate, I just wanted to draw your attention to a great relational database product — 4th Dimension from AC — that runs on both the Mac OS and Windows 95/98 and Windows NT. We have developed over 15 applications using this tool.

Thanks for the good review — by the way on Microsoft's Plug and Play (not).

Jody Boyer
President
Jovian Software Corp. Inc.
Edmonton
jody@jovian.com

Can we please review anything other than Apple?

I enjoyed your editorial (CW Sept. page 8) on the aspect of the side of the Canadian dollar but most despise that "it's a wash."

Still, most hardware components are made in Asia, but virtually all software is from U.S. companies. We have seen a five to 12 per cent increase in the price of Adobe, Microsoft, Macromedia, Davidson etc.

With margins usually only slightly better than hardware, the price increases from Ingram and Micro have had a major impact on our pricing and ability to hold prices for customers. (S)

Bill Gossard
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Pavot Micro
London Ont.
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Letters to the Editor

We welcome your letters on industry events and concerns, as well as your comments on our magazine.

We reserve the right to edit your contributions for length and clarity.

Please write to The Editor, via e-mail at cs@cspace.ca, or fax 905-408-2655.

Well hello there, I'm Mr. Whimper, your temporary CEO. I look forward to forming some great synergies with you and developing personal appreciation within the firm.



I'll be looking closely at the company to see where I can synergize each worker as far as how power make yourself included. Well, get to work. Lunch date you know.



Why has Mr. Whimper run off screaming?



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CANADA WATCH

Correl CLPs on to distributors

Correl Corp. has named Ingram Micro Canada and Merisel Canada as new distributors of the Correl License Program (CLP Universal).

Both companies are now selling CLP Universal and CLP Universal Academic licenses. The licensing program offers technology and technical support for medium to large sized organizations, says Correl CLP.

Merisel also offers additional no charge features including convenient usage and meter and laptop usage, based on a point system.



Merisel: Happy times are here again

Merisel Canada Inc. is reporting to pull in about \$1.25 billion dollars in 1994 according to Ron Smith, the vice president of the company (see p. 10). He took some time to chat with *CCW* during the Calgary stop of the recent Meriselling road tour.

The company has about 600 employees in Canada. First quarter revenues were up 10 per cent over last year, and Q2 was up 23 per cent, said Smith. "I find myself far happier to be joining the company this stage," he said, representative to customers is driving Merisel's growth at above average industry growth rates. But he said this real "need test" will be: "Are Merisel's customers able to grow their businesses more profitably than in the past?"

Smith said his engineering background makes him very process oriented, and noted the processes of the company have to be easily adaptable to evolving needs. "In this industry it's like picking up dinner without a five-centimeter life line to the queue on our feet."

Bill Jones, vice-president of sales for the compa-

ny said Merisel is regaining market share lost during a difficult implementation of SAP's business software in 1993. He said the system now works very well for the company, and the U.S. will join Canada on SAP by February.

About 5000 terminals were expected to turn out of Meriselling events this fall in Toronto, Calgary, Vancouver, Montreal and Halifax. "Our industry is growing like crazy," said

James McElrath, vice-president of marketing for Merisel Canada. The new focus in the industry is not just "How do I grow?" but "How do I make money?"

To meet that need, vendors provided not only technical seminars, but also business-oriented topics. For example, Hewlett-Packard offered a session on "Competing in a Competitive Environment."

Regarding Meriselling, Ian Gower, national distributor sales manager for Quantum Canada Inc., in Mississauga, Ont., said "It gives us a lot of exposure to the reseller market. It's a great way for manufacturers with the software selling our products."

Gary Dorn, president of Edmonton-based The Byte Truck, said his was particularly impressed by IBM's commerce conference. Besides that showed how "a small company can have a huge presence for a small amount of money it's an affordable solution."

Gown said his primary reason for attending Meriselling is "to talk to the people I deal with on a regular basis."

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Lexmark picks up rebate promo

Lexmark Canada Inc. is offering end-user rebates on four color inkjet printers until the end of October.

This promotion will see purchasers of the Lexmark 1130 Color JetPrinter pick up a \$20 rebate. Meanwhile, there is a \$10 rebate available on the Lexmark 3300, 5000 and 5700 Color JetPrinters.

Delivering away in a Jeremy...

David Johnson, an inside sales rep for Ingram Micro Inc. (Canada), is working around in a 1994 GMC Jimmy for a year, after earning a sales promotion run by Synetics Canada. Positioned here, Ingram Micro's inside sales manager Doug Hill accepts the vehicle on Johnson's behalf, from Synetics Canada's general manager Chris Moravitz.



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Polaroid mounts a few good WAPs

Tech Data India deal with Konica

Tech Data Canada Inc. has signed a distribution agreement with Konica Business Technologies Canada Inc. Tech Data will distribute the Konica XL 3015 Force Color Printing System—an desktop color laser printer.

The multi-faceted Konica 7410Plus, 9600 Internet Fax, Konica Digital Camera and the Konica Force 16 network printer are also included in the distribution agreement.

Polaroid, a company well known for its instant photography technology, also has a line of enhanced digital photography, scanning and printing products, including the P10-100 digital camera, SpectraScan transparency and film scanners, ColorStar digital Photo Printer, iPhoto Slide Printer, Professional Film Scanner LCD projectors, and associated software and supplies. Although the products and the technologies incorporated in them are good, Polaroid has limited its commitment to the professional graphics, photography and presentation markets.

In recent months, however, Polaroid has decided to step back on light under a lamp and has done advertising in major print media across Canada to increase awareness of its commercial imaging products. The company is also interested in increasing its deployment and is looking to attract and motivate new WAPs. Polaroid runs WAP programs on a regular basis and provides demo and sales materials to resellers.

Envision goes public with privacy

Envision-based Envision Technologies Inc. has announced an initial public offering of more than 7.7 million shares at a price point of \$16 each, at a sale managed by a group of stock market firms including Goldman, Sachs & Co.

Envision has been recognized over the last year as one of the world's leading developers of PIV (public key infrastructure security and encryption) technology. Its technology is in use or under evaluation by many large government agencies and private corporate worldwide.

An electronic commercial enterprise to expand rapidly in 1998, the issue of secure private electronic communications is becoming ever more critical to nations, enterprises and private individuals. The stock market has cooled recently in its enthusiasm for high-tech stocks generally, both because of the economic troubles in Asia and elsewhere, and a cold realization that many highly touted new firms didn't have as much real profit potential as hoped. However, especially in an age of uncertainty, the potential revenues and profits of a company like Envision, with its strategically critical security technology, may make an attractive investment. Envision claims that the proceeds from the IPO will be used "for working capital and other general corporate purposes, including product development." (E)

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INDUSTRY FLASH

Set-top to see serious computer!

(NB) — Matsushita Inc. and its new Blackbird television set let box owners digital communications and multimedia processing capabilities and like the functions of a broad-band router, a network computer and a digital home cinema platform.

Matsushita claims that Blackbird is the first open platform to support interactive 3D graphics, Java, MPEG digital video, high-fidelity audio, Internet access, interactive commerce and broadband networking, to name a few.

Blackbird supports Matsushita's Future PC CPU (central processing unit) and communicates capabilities with the Project2 Media Architecture. The set also includes a robust real-time operating system, Java support, a HTML-based Internet content engine and user interface, high-level multimedia application programming interfaces, embedded security and extensive support for broadband networking.

Production shipments of Blackbird began during the fourth quarter and commercial shipments begin in the first quarter of 1999.

Bye, bye, Unimatrix Deluxe

(SD) — Symantec Corp., bowing to a judge's order, announced it has removed Norton Unimatrix Deluxe from its Norton SystemWorks utility suite. The uninstall program, subject of a copyright infringement suit by CyberMedia Inc., went by the board.

Unimatrix track software installations under Windows and later can remove unwanted software completely, including so-called "orphan" files and "empty" registry entries, both of which can load down a system and cause conflicts.

Symantec's chief technical officer, Enrique Selens, downplayed the significance of the move. He said "Basically what's going on is that we're catching up to what's in a lawsuit of code we have 200,000 lines of code and a trademark that, the developer — the person who wrote it for us — is basically saying they own it, and CyberMedia

thinks that they own it."

Selens explained: "At this point we don't want to keep putting our customers and partners through all the ambiguity of the legal process. Our partners in the channel can starting to be impacted by this."

To minimize the loss of the Unimatrix Deluxe utility, Selens said Norton will ship a new suite with an extra CD-ROM holding four of the firm's well-known utilities as a SystemWorks Bonus Pack. The new programs, which Selens said bring the value of the package to "greater than US\$900," include Norton Media Commander, a utility not designed for Internet; WinZip Page, a World Wide Web HTML, Hypertext Markup Language editor; WinFax Lite, for sending and receiving faxes; and goAnywhere Express, a Java ActiveX plug-in that gives Web browsers the Java PCAnywhere program's remote controlling features.



Xerox goes home with new products

(SB) — Xerox Corp. has announced big plans to penetrate what many think will be a booming small office/home office (SOHO) market over the next couple of years. To succeed Xerox will have to wrest market share from other firms already entrenched in the SOHO space, such as Hewlett-Packard, Dell and Canon Inc.

The firm says it will introduce 60 new personal and networking products during the next two years. The firm also plans to expand into more than 10,000 stores and invest US\$200 million in a marketing push.

As part of the push, the firm will greatly expand its "affordable" lower-end ink jet products.

At a press conference to announce a new line of digital laser SOHO copiers, Jan Finnsson, president of the Xerox Channel Group, said Xerox is "increasing the intensity" of its channel business. The long-term target is to move "a significant percentage" of Xerox's worldwide revenue through indirect channels like retail stores and resellers, Finnsson said.

To that end, the firm plans to grow

its retail outlet channels by more than 40 per cent, to include business-to-business and dealers by over 30 per cent.

The Xerox X305 laser copier, currently priced at US\$200 for the base feature-rich model, the firm said its new Xerox WorkCentre X3100 copier, which it costs now sells for US\$179, the device now sells for US\$169 per minute (ppm) or print eight pages per minute (ppm). The new feature-rich equivalent version, the X3100, sells for US\$209.

An upgrade X3120 model, due to hit retail channels in December, will copy 12 copies per 10 ppm and stores with a 30-sheet document feeder and 500 sheet paper tray capacity for US\$199, said Finnsson.

A lower-end X305 model will arrive in November with 8 ppm copying and 8 ppm printing for US\$209. A workhorse club model with fewer features but the same copy/printing ppm laser engine, the X302 will sell for US\$159.

All the new SOHO models come with a full three-year warranty and toll-free support.

TV on PCs? The potential is huge

(PB) — There will be Windows-branded enabled PCs at home by the turn of the century, according to a report commissioned by Philips Media Intelligence Services (PMIS).

The study, called "PC97" by MegaTech's Linda Lee Bower, cites forces including digital broadcasting of TV signals, HDTV high definition television, and the growing number of PCs in homes.

The firm also predicts the number of HDTVs at home will reach about one million by the turn of the century.

TV network CBS and other broadcasters are already working to comply with the U.S. Federal Communications Commission (FCC) requirements to begin broadcasting digital signals later this year, a Philips source said.

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IBM AS/400

As a line of servers, IBM Corp.'s AS/400 computer has gathered a dedicated following over the last decade, gaining and maintaining market share against the Windows NT and Unix variants.

With 500,000 units shipped worldwide, (and rated the number one system in ComputerWorld's 1997 Buyer's Survey) the AS/400 is certainly a major force in the high-end server market.

"It is planned to appear that AS/400 is a very vibrant business for IBM right now," said IBM's AS/400 general manager, Tom Jaroch, who kicked off a recent announcement in New York City. With a new processor and a new version of the operating system, the AS/400 line is poised to capture even more of the business server market.

The first of the announcements was the release of the new processor, known as the Nextstar. This fourth-generation 64-bit RISC chip will run at either 200MHz or 262MHz, and will be included in the new higher-end servers introduced (the 540 and the 690 models). These CPU speeds seem a bit on the slow side, when today's machines are topping out at 450MHz. But as Jaroch pointed out when greeted about the chip speed, "No customer has ever asked us about that. They're more concerned with how the machine works for them."

The big news for the 64-bit server line is the upgrade of the operating system to V4R3, which will incorporate many extra features and more functionality. Now, the operating system not only incorporates native Domino and NT functionality, but also becomes easier to set up and use. Setup for all aspects of the AS/400 are point-and-click, using the familiar Windows NT file system client including the E2 Setup Wizard, a Security Wizard for easy and quickly setting permissions, and Management Central, which provides "real-time graphical performance monitoring of managed systems."

The new operating system release also features enhancements to some previously available components, including the built-in HTTP server, the AS/400's firewall, improved

query time using vector-based searches, and improvements to Domino (including a higher maximum file size, and Java Servlet support).

Java integration appears to be a large focus of the AS/400 team, which has incorporated the Java virtual machine right into the minimal code for improved Java performance. Also included with V4R3 are the AS/400

security system.

The positioning of the AS/400 as a machine that's ready for business "right out of the box" makes a lot of sense, not only for that market, but for users as a whole. Setting up a server for mail, the Web, a database, and for Web business is not only a lot of work, it's also intimidating. With the convergence of all of these different applications in the AS/400, "...you don't have to worry about making the computer work," explains Jaroch. "We've already done that back in Rochester, Miss."

In fact, the company decided to practice what it preaches in its Rochester head office. Previously using 40 mail servers and 10 application servers to meet the needs of staff, the office converted to three AS/400 servers.

Not every business would have that amount of information to handle, but the AS/400's scalability is something that IBM hopes will appeal to the growing business. With the performance difference between the entry-level machine and the highest-end unit being a factor of 330, there's a lot of steps in between for a business to migrate. Add the ease-of-use, and you have a machine that becomes more attractive to a wider range of people looking for a server solution.

"There's a movement in the market-place to go with NT as the operating system of choice. There are good arguments as to why the AS/400 is a better alternative," says Stan Peck, director of end-user research at International Data Corp. (Glaston) Ltd., in Toronto. "People buy Unix because they want to customize their own stuff. When you sell an AS/400 to a small startup, his speed and ingenuity is the last thing they're interested in—they just want to know if it will do their accounts receivable properly, and that they won't have to hire a whole pile of staff to run it. It all comes packaged so you know it'll work." ☐

Stan Corvath is a Lab Test Editor for Canadian Computer Weekender. He can be reached at stan@ccp.ca.



Tom Jaroch

by Stan Corvath

"There's a movement in the market-place to go with NT as the operating system of choice. There are good arguments as to why the AS/400 is a better alternative."

— Stan Peck

Developer Kit for Java, the AS/400 Toolbox for Java, Java Servlet support via the enhanced HTTP server, Sys FinaSec support, and Java Beta support from WebLogic's Tanager.

Setting up the AS/400 for capability is another area the people at IBM are enthusiastic about. With a tight integration of the HTTP server, Java, the security server and the payment server. Security is a big component in the web business equation. Says Jaroch, "In the 10-year history of AS/400, none of our systems has ever had a virus, or has ever been hacked, that we're aware of." This security is an attractive feature for the business user who wants to be able to set up for business on the Web without having to worry about all of the

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Symantec Inc. has always been one of the most pragmatic software developers in the PC industry. Its recent joint initiatives with IBM Corp. have demonstrated further that when exploring a market opportunity is concerned, Symantec is determined to work with, rather than against, the other major players in the industry, whenever possible.

Symantec has made a comfortable living for more than a decade, and grown into a US\$1-billion-a-year company, by determining what computer users need in order to have a fully satisfactory computing solution — or more specifically, what was lacking in the basic operating systems developed by companies such as Microsoft Corp. and Apple Computer Inc. The result has been a stream of products that filled in the gaps of MS-DOS, Windows and the Mac OS: products such as Symantec AntiVirus for Macintosh (SAM), Norton Utilities, ACT!, Norton Network Administrator for Windows, and PCAnywhere. And recently, Symantec announced a raft of new products, including Mobile Essentials, a collection of utilities for mobile computer users, a Norton Year 2000 product, and new versions of ACT!, WinFax Pro 9.0 and TalkWorks Pro 2.0. At the same time, Symantec has announced a major strategic alliance with IBM, whereby IBM and Symantec will pool their anti-virus research and technology, and develop a digital "immune system" that incorporates a variety of techniques to avoid network and data security being compromised.

Symantec Pragmatic with IBM Partnership

Alliance will Vaccinate Against Competitors



by
Jeff Evans

and become allies rather than competitors, was a smart way to remove the main obstacle to their cooperation.

One of Symantec's major tasks, according to comments from senior Symantec executives, is to ensure that IBM's vast global sales force gets a clear picture of the benefits of working together with Symantec. It's not just a matter of a \$40 licence fee for Norton AntiVirus, one executive said, it's also ensuring that Network Associates doesn't use its McAfee anti-virus brand as the face-in-the-enterprise-door to sell a whole a-commerce solution, for example.

Symantec is likely to find that having access to IBM's unparalleled R&D capability, as well as its own well-recognized Norton, ACT! and WinFax brand names, will give it a whole new boost into the business computing market. Symantec is not putting all its eggs in one basket, however. The company still maintains a very close relationship with Microsoft and Apple, both of which have benefited from having Symantec idiosyncratically providing solutions for the weaknesses in their operating system (in fact, Microsoft announced earlier in the year that it would license a basic form of Symantec's filing software for its Windows operating system).

Symantec sources say the company has no desire to pick fights with industry giants such as IBM and Microsoft. Rather, the landscape created by the industry's giants creates many little locations for Symantec to tend its own garden, to everyone's advantage.

For more information, see <http://www.symantec.com>. ■

Jeff Evans is Associate Editor of Canadian Computer Weekender. He can be reached at jeff@ccw.com.

Symantec has Fall Crop of New Products

by CCW Staff

Is this for the busy fall season, Symantec Corp. has launched a number of new products geared mainly at the small office market. Here's an overview. Updates to all products can be received electronically as the on-line Update humans.

Norton 2000

Symantec is looking to address the Year 2000 number bug with the launch of Norton 2000 for desktop PCs and distributed computing environments. It includes data recovery, an application scan database and 3,000 test-and-fix capabilities. The product will also scan popular applications and alert users to known problems in those products. Pricing is \$99 per user, based on 10-user volumes.



TalkWorks Pro 2.0

The voice and fax messaging software features enhanced voice mailboxes, customizable recorded greetings, instant message software, call tracing and fax-confirmation. It also provides voice/fax/fax description, which means the system can recognize whether an incoming call is voice or a fax, which the company says saves on the cost of toll-free phone lines. The product is priced at \$59.



Norton SystemWorks

For Windows 95/98.

Norton SystemWorks

Symantec calls this an "integrated suite of utility and anti-virus products." That includes Norton Utilities, Norton AntiVirus, Norton Ghost, Norton CleanSweep and a six-month subscription to Norton Web Services. The suggested retail price is \$74.

Norton Anti-Virus 5.0

The company says the \$59.95 product for Windows 95 and 98 users offers increased security and ease-of-use. It has a Quarantine feature, to isolate questionable files, which can be encrypted and submitted for analysis to the Symantec AntiVirus Research Center (SARC) in California. This product includes the Bloodhound technology which runs suspect programs in a virtual computer space, so the behaviour can be analyzed and categorized. An NT server version is available for \$69.95, which includes one server and 10 workstation licenses. See <http://www.symantec.com/norton/updates.html> for a full list.

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DRAM

makers hunker down for slow market recovery

by David Tansik



David Tansik

Manufacturers say

it's impossible to

make money on

memory chips under

the present market

conditions."

Perhaps the world's DRAM makers. They've been on a rocky road for the past couple of years, and there's no immediate relief in sight. Over-capacity in DRAM production and lower demand because of the Asian economic crisis are among the factors that have led us to the present situation. Even as vendors slowly move from 16Mbit to 64Mbit chip production, they are scaling back on volumes and taking other drastic steps.

The recent flurry of plant closures, consolidations and lowering of projections shows an industry in survival mode. Manufacturers say it's impossible to make money on memory chips under the present market conditions. Most chip-makers are first taking strong measures to weather the storm and second, making sure they end up in a competitive position when the market turns around. Just last month the following events unfolded:

- Hitachi America announced on Sept. 1 that it was immediately closing its chip plant in Texas and merging its two semiconductor units in the U.S. into one. The merger was to take place one month later.
- Mitsubishi Electronics America announced it would close an assembly plant in the U.S., effective Sept. 6, and move the functions to plants in Japan.
- Fujitsu announced it would be closing its DRAM plant in England in December. (In July, the German high tech firm, Siemens, closed a DRAM manufacturing facility in England.)
- Two Korean chip giants, Hyundai and LG Semicon, announced they planned to combine their chip manufacturing operations into a single new company.
- NEC cut its investment in memory chips by 20 per cent.
- While not directly related to DRAM, Motorola announced it is eliminating the consumer systems group from its Semiconductor Products Sector. This is part of a restructuring plan the company announced earlier this year.

Similar news has been dribbling out of the DRAM manufacturers and analysts for much of this year. Back in June, Samsung shut down a DRAM plant in South Korea for one week. In the same month, Hyundai stopped development of a US\$1.6 billion DRAM facility in Scotland.

In July, Gartner Group's Dataquest division projected that the worldwide volatile disk equipment market in 1998 would be down about 37 per cent from the previous year, and would show only slight growth in 1999.

Three months earlier, in April, another Dataquest report indicated that DRAM demand would exceed supply only in the year 2001. Looking at two recent announcements in detail, we see both the consequences of overcapacity, and of the havoc that the Asian economic crisis has wrought. South Korea has been hit particularly hard by the Asian economic crisis, with its currency reduced to half its value in a year, and its industrial base in need of an overhaul. The Hyundai/LG Semicon announcement of the merging of the two chip manufacturing operations is just that. It is part of a larger industrial restructuring going on in South Korea of its major industrial conglomerates, or "chaebols." Other mergers involve a diverse set of industrial sectors including energy, chemicals and transportation.

Between them, Hyundai and LG Semicon say they have about 15 per cent of the DRAM market worldwide. According to a Reuters report, the merged company would be second only to Samsung in production capacity for DRAM chips.

On this continent, Hitachi's actions are typical of the difficult decisions individual technology manufacturers are making, given the current market conditions. Hitachi America has merged its two operations, Hitachi Semiconductor (America) and Hitachi Micro Systems, while shutting down (or "idling" in Hitachi's words) a wafer fabrication and assembly plant in Texas.

The merged organization will be called Hitachi Semiconductor (America). In a statement announcing the reorganization, Kosei Notoya, chairman of the new Hitachi Semiconductor (America) division stated: "The growing need for intelligent command and control in many industries in North America is presenting important market opportunities." He also noted the difficulties caused by overcapacity in memory chips. In the same announcement, Peter Clark, who becomes president and CEO of the new Hitachi Semiconductor (America), said, "Hitachi has formidable capabilities as a systems-on-silicon supplier."

It's not surprising then, that the company will focus on development of microcontroller applications and Hitachi's SuperB RISC chip family, and other "large-scale integrated semiconductor systems." This underscores one of the primary strategies many manufacturers have taken, to rely less on DRAMs as standalone products, and incorporate them as part of large-scale integrated chips. □

David Tansik is Editor of The Computer Paper. He can be reached at dsd@comp.com.

Who Goes There?

Network intrusion creates a new breed of

by Don McLean

Networking poses a world of danger these days. Security breaches are epidemic and a whole subculture of hackers, crackers, cyberspooks and even white collar-served-lance professionals have made it their life's occupation to find ways of invading corporate enterprises and even home computers, in an effort to make off with precious information or simply to wreak havoc.

The horror stories of IT misuse have become familiar urban tales:

- A disgruntled employee who, through the pursuit of some twisted form of revenge, plants a cyber time-bomb in a computing system that at a prescribed moment releases a devastating cryptic game.
- A lonely 30 something cracker sits in the basement of his parents' home in suburban, hacks his way into the Walt Disney Web site and posts an assortment of reward notes JPEG files retrieved from old libraries' sites.
- Or, the real secret story of the Cult of the Dead Cow, a notorious group of IT loons who at a Las Vegas hackers' convention this summer revealed a BackOffice Trojan horse program (called BackOffice) that is so simple to use that "a five-year-old child" could remotely take over a victim's Windows-based machine.

Cyberspace is a chaotic place, fraught with evil doers of all kinds. People are waking up, as computer crimes have created much greater awareness of the perils of connectivity. During the past year for example, network security has become top-of-mind for practically every CEO in all kinds of organizations. But the technologically savvy network insiders are literally keeping pace with many network security tools and professionals, driving home the point that security must stay at least a step ahead.

A new breed of services company is emerging — integrators who specialize in the consulting, implementation and management services around the tools that monitor and prevent intrusion.

A new breed of services company is emerging — integrators who specialize in the consulting, implementation and management services around the tools that monitor and prevent intrusion.

It's a relatively new area of line of work — barely two years old — that's being driven by the use of public networks to connect businesses and individuals to one another.

According to International Data Corp. (IDC), there's a growing demand by corporations for outside services providers skilled in network security technologies to properly implement all sorts of solutions, especially firewalls. In addition, there's an assortment of new emerging offerings in the network security services realm, including internal and external intrusions testing and analysis, security policy development, site security assessments, firewall evaluation and configuration and phone line scanning.

Network security services are but a small slice of the current \$15 billion-plus total Canadian IT services pie these days, but the expectation is that it will grow to be among the most significant and important services areas in the new millennium. Recent estimates from IDC peg the entire network security services market in Canada at \$12.5 million for 1996. (This basically covers consulting and integration of network security solutions and does not include

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hardware and software costs.) Conservative forecasts project the market will grow to more than \$31 billion by 2003.

The bad news for society (in general) is that intrusions and other connectivity crimes are on the rise and the perpetrators are becoming increasingly more sophisticated. The good news for retailers, systems integrators and network integrators who are looking for a new business frontier is: The network security services space is a wide open territory right now.

"We went a good two or three years (in this business) without any competition at all," says Tony Furelough, Canadian business manager for network security specialists Brink Systems Inc., based in Mississauga, Ont. Brink began life back in 1990 as a systems integrator, but was driven to focus exclusively on network security services. "Now there are one or two (network security services companies) popping up and a lot of smaller retailers, too. We're finding a lot of competition, but not a lot of specialists."

Add Mark Allison, operations manager for M-Tech Mercury Information Technology Inc., a network security services consultancy in Calgary: "I think there are a lot of people who would like to get into this business. We've found that there isn't really a huge amount of competition. There are companies such as Proxi-Watchhouse and Ernst & Young who have divisions that deal with network security issues and I think they're becoming more focused on that. Right now, though, we don't see a whole lot of competition, but as the years to come (we expect) it will be a growing market."

M-Tech began as a company in 1992 working with oil and gas corporations, addressing the growing needs for network security. M-Tech currently employs some 30 consultants and has achieved approximately 30 per cent growth during a period from 1997 to 1998. M-Tech develops network security applications and provides services behind those programs — a roughly 40:60 split in terms of revenues. The company does virtually all of its business in Calgary. "There's a lot of work here and the company is growing steadily," Allison says. "We don't want to make too large a jump too soon so we're being very careful about our future expansion."

Brink has grown into a network security services company of 30 employees spread across two locations in Mississauga and Calgary. The company's business is typically prescriptive rather than preventative, meaning most of its customers are those who've generally been the victims of a network security problem. Furelough says the value-add of services behind selling network security products is the key to his company's current and future success.

"Not a lot of people can support the products," he says. "A firewall is so critical. At two o'clock in the morning when a firewall goes down you don't want to call just [any] retailer. You want someone who will solve your problem."

Brink operates a live 703-943-1365 call centre in Mississauga. The financial and insurance industries appear to be the vertical industries who have the highest demand for network security services, according to Furelough. "All of the major banks and insurance industries are coming to us... for advice on how to set up their networks so, at all times, they already set them up, to check whether they've done it right. Some want their existing networks audited to ensure that everything is configured and set up properly."

The largest portion of M-Tech's business involves assessing the vulnerability of network firewalls through a range of services called penetration tests. Among the services involved is something called "flooding" which is an attempt to take down a server by sending large amounts of data through it. Other network security testing activities might involve attempts to retrieve passwords, access corporate data-

bases or simply roam through the information systems of a company in an effort to validate the integrity of systems and networks.

"Penetration testing has rapidly become our number one best seller as a service," Allison says. "That's because most companies are getting onto the Internet and obviously are left wide open unless all log-holes are closed."

Raj Patel, a network security consultant for Montreal-based Maman Services Inc., says client-driven and network-to-network searching through the Internet are increasingly pushing demand for firewalls and other secure solutions such as virtual private networks (a technique for building secure Internet-based WAN infrastructures, using encryption and authentication tools). Generally, network security tools, he says, provide users with the ability to monitor and limit the activity on their networks. "The greatest benefit of a network security product is the ability to log (network activity)," Patel said. "To monitor and log everything that occurs and through that, you can determine what means you've got going on."

The complexity of network security tools are clearly such that not every retailer is capable of quickly diving into the services side of this business. It takes a specialized set of skills to enter this young market. M-Tech for example, has in the past attempted to market its P-Synch centralized powered synchronization applications through a variety of partners.

"We've attempted to go through retailers and haven't really had a whole lot of success, mainly by because our network security software requires a lot of know-how," says M-Tech's Allison. "The learning curve is just a little too large for most companies who want an out-of-the-package solution."

Ultimately M-Tech says it is looking to work with larger software vendors to implement their network security software within a broader software package. Sun Microsystems was mentioned in one potential partner.

Probably the greatest challenge for retailers looking to enter into the emerging space of network security services in the current need to be a specialist. Perception in the user community is such that most companies want to deal with a service provider who has a particular focus and strong expertise in network security. In addition, because the network security services market is relatively new, it's tough to learn the skills of the trade. Probably a good place to start gaining knowledge is with some of the current leaders in the hardware and software space around network security products. These would include the likes of Check Point Software (the current leader in firewall software), Cisco Systems, IBM, Sun Microsystems, Network Associates, AEGIS, Novell, Computer Associates and Microsoft, among others.

Everyone agrees that the demand for network security services is increasing at something of a breakneck pace. IDC predicts five-year average growth rates of 28.2 per cent for security consulting, 28.4 per cent for security implementation and 47 per cent for security monitoring services. The market researchers also predict a growing number of service providers are expected to move into the network security market for Internet and network security consulting and integration services over the next several years. "Every year demand just keeps going up and up," Allison says. "Even smaller Canadian companies are saying 'If we're doing business on the Internet we need security. Even if we're not doing business on the Internet we still need security'."

We go by the premise that, by the year 2001, every major company in Canada will have some sort of security measures within their networks." ■

Don McLean is a Toronto-based journalist who specializes in high-technology reporting.

ATI makes big splash

with new

Rage 128 products

By Grace Courtenay

It's a huge international media event held in Toronto recently. Canada's own ATI Technologies Inc. announced a new family of high-end chips and boards based on its Rage 128 technology. In fact, the new technology will deliver four times the performance of the company's current All-in-Wonder Pro product, the company claims.

In July, ATI, with 1,300 employees, announced it had passed the \$1 billion mark in annual revenues. (The stock's market capitalization is worth \$4 billion, says the company.) By August, the company said its exports alone accounted for more than \$1 billion.

"ATI is a true global company," said K. Y. Ho, ATI president and CEO at the international press briefing, held in Toronto. But he added: "ATI is a proud Canadian company."

According to a study by Mercury Research, ATI accounts for more than 24 per cent of all graphics shipments worldwide. And as of Aug. 27, the company had shipped more than 10 million accelerated graphics port (AGP) controllers.

Peter Wheeler, product marketing manager, commercial desktop for ATI, based in Unionville, Ont., explained the speed of the new Rage 128 chip comes from having two pipelines to allow pictures to be drawn to the screen that much faster. Moreover, the speed of these pipelines has increased by changing from 64-bit to 128-bit technology.

ATI's new Rage 128 VR is a 128-bit graphics and multimedia accelerator chip meant for sophisticated implementations. It has support for 16MB of graphics memory in a 256-pin BGA package. It includes a dual-rendering pipe, alpha-math architecture, an eight-bit stencil buffer, a 32-bpp renderer, a 32-bit Z-buffer plus alpha and fog effects. It allows for bi-dimensional direct memory access (DMA) for the storing of information in system memory instead of local graphics memory. Pricing is US\$300 in 10,000-unit quantities.

ATI also announced the Rage 128 GL chip, designed for mid-to high-end 32MB of graphics memory, with a 128-bit memory interface. The chip is optimized for Pentium II

class systems and uses a technology called Constant Command Engine (CCE) for efficiency. That decouples the process and graphics subsystems and takes advantage

of the write-combining feature in the Pentium II, says the company. ATI says the chip is suited for full-screen DVD/MPEG2 video, plus 3D rendering. It's priced at US\$440 for 10,000-unit quantities.

On the board front, ATI announced the Rage Fury product aimed at heavy-duty gamers, with 32MB of memory. It uses a dual-rendering pipe. The product includes an integrated DVD/MPEG2 and four-up filtered upscaling, both horizontally and vertically, along with front-end and back-end scalers and a hardware sub-picture decoder, says ATI. The product will ship in October, at a SRP of \$445.

ATI's Xpert 128 is a 3D and DVD accelerator board with 16MB of graphics and a 250MHz DAC. It will be available in November, for \$285.

ATI's GDM based product is the Rage Magma graphics accelerator board, with support for OpenGL. It delivers polygon counts at resolutions of up to 1,800 by 1,200. The 32MB product

offers DVD/MPEG2 playback with a DVD decoder; it will be available in November. OEM pricing is \$445.

Jon Richardson is sales director for a company called Rage Software plc, from England. (The name "Rage" name is merely coincidental, the company says.) He says ATI's new

Rage 128 technology allows for better bump mapping and multi-texturing in his company's games software. "If we can support any new technology, we will do so and set a new benchmark."

Jon Peddie, president of market research firm Jon Peddie Associates (JPA) in Tiburon, Calif., said "ATI has proven they not only have the staying power, they have leadership power." He ranked graphics chip manufacturers in the following order, according to market share: ATI, 32, Matrox, Nvidia and 3D Labs. Meanwhile, when it comes to graphics boards, the ranking is: ATI, Matrox, Diamond, STB and Creative Labs, said Peddie.

In other news, General Instruments Corp. recently announced it would use ATI graphics chips in the DCT-9000+ interactive digital cable set-top terminals. GI says it will supply North American cable operators with 15 million terminals over the next three to five years — an estimated value of US\$4.5 billion.

ATI is also an active participant in the Digital Flat Panel group. Wheeler and ATI is working to help set standards for a digital interface to digital flat-panel displays. Digital flat-panels take about \$60 in costs out of the unit, which translates to about \$420 at the user level, he said.

Among the many international journalists and pundits at ATI's official Rage launch was Germany's Tom Pabst, the well-known author of *Tom's Hardware Guide* (<http://www.tomshardware.com>). He said ATI's "presentation was very professional and impressive," but said he'd withhold final judgment until he got a chance to test the product himself. But nonetheless, he predicts market share likely surpass those of Nvidia's TNT board. ■

Grace Courtenay is Editor of Canadian Computer Weekender. She can be reached at grace@broadcom.ca.



Atop 32 pipeline chip



ATI Rage 128 graphics board

Graphics chip manufacturers, ranked by market share:

ATI 32 Matrox Nvidia 3D Labs

Graphics board manufacturers, ranked by market share:

ATI Matrox Diamond STB Creative Labs

Source: Jon Peddie Associates

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Laser Printers:

SPEED AND

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TO MOVE!

by Sean Connolly

There's something about the mere mention of laser printers that scares the average consumer, even though lasers are now as relatively common as... People tend to regard them as big, hard to use, and expensive.

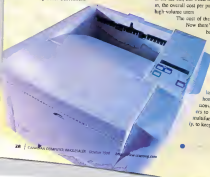
Further, with the quality improvement of ink-jet printers over the last little while, a lot of the mental ground that the monochrome laser printer had gained seemed to fade away again. Why would I want to buy a laser printer when I could have a color machine with comparable quality?

While it's true that ink-jets have become quite popular with the consumer, they still haven't addressed the needs of the more professionally oriented users. A touch of color can add a lot to a business document, but ink-jet print speeds are still too slow for environments where a lot of text has to be printed out, quickly. And despite the improvements in print quality (many ink-jet models produce "laser-quality output"), the cost of ink cartridges quickly becomes prohibitive in an office that prints hundreds of documents a week.

In fact, the cost factor still tends to be the most common misconception about the laser printer, largely due to the initial investment costs. Someone once said, "The human body is nature's way of moving water from one place to another." Similarly, the ink-jet printer could be viewed as a way of moving expensive ink from one place to another—the initial investment in the ink-jet hardware is low, but the cost of replenishing the ink is high. With the laser printer, the hardware cost is typically a lot higher off the bat, but when the cost of cartridges (and their yield) is factored in, the overall cost per page winds up much lower overall, especially for high-volume users.

The cost of the hardware has come down over the years, too. Now there's a good selection of high-quality laser printers below the \$1,500 mark, and a healthy number of those are below \$1,000. For the small or home office, this makes laser technology more affordable than ever before. For small office or home users who need high-quality text on a hurry and aren't overly concerned about color, laser is quite possibly the best option.

This month, we looked at a number of the laser options available to the small office or home user. In addition to the traditional laser systems, we also reviewed a couple of color laser printers to look at, and a small selection of laser-based multifunction devices. These were looked at separately, to keep things simple.



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Brother HL-1050dx

Street Price: \$200

Always a big player in the laser printer field, Brother has a number of models available. The one we looked at is a new 10-page printer with a user-friendly design and some appealing features.

Price: The printer features 1,200 x 600 dpi resolution in graphics mode for smoother output.

In addition to the standard parallel interface, the HL-1050dx is one of the first laser devices to feature a standard USB connector.

The wider top-loading mechanism not only permits the same input area to be used for both letter and legal-sized sheets, it also allows larger man- to- to- inch envelopes to be run right through the printer, eliminating the need for labels.

The first year of the two-year warranty includes the Exchange Capex coverage replacement policy.

Case: The output tray is at the top of the machine when shipped, which folds out and down to receive paper. In that mode, it seems a bit flimsy.

The HL-1050dx has a lot to recommend it, with 1,200 x 600 dpi graphics capabilities, and 10-page print capability. The wider feeder allows larger sheets of paper and envelopes to pass right through the printer, which is definitely a plus for users who would rather not deal with the hassle of labels. The standard USB interface is also a good selling point, as more users switch to machines with USB interfaces, and to Windows 98.



A Shot of Color

by Dave Casanova

Color laser printers at present are at the stage monochrome lasers were a number of years back: big, heavy, complicated, unreliable and expensive. The emphasis is on expensive because the pricing, at \$3,000 and higher, puts a color laser solution out of the range of most home or small business users. (Of course, color lasers have already come down substantially in price over the last few years.)

At the point in their development, color laser printers are still relatively large, due to the number of components that must be accommodated (and the lack of time to shrink-bake on has happened with the weight of monochrome laser refinements). Instead of a single toner cartridge, the color laser uses four. With the way that all of these parts go together, it can be a bit overwhelming trying to figure out what goes where. The cartridge installation process with most monochrome laser devices may be as simple as exposing the cover and pushing a cartridge into a slot. Color models, on the other hand, will require a bit of disassembling and excavation to get everything into the right place.

Additionally, the color laser requires a special oil cartridge for the printing process. This makes the printers far more available than their monochrome or ink-jet counterparts. If the machine is tilted the wrong way or sharply jostled, the oil would get into parts of the machine that don't get along well with the oil, causing serious damage.

What's the upshot like, though? We had a chance to look at two color laser printers, the Xerox's new ColorPrint Series, and Brother's HL-3400C model. With the technology still relatively new, there is room for improvement (and with the way the industry moves, you can bet that improvements will come — fairly quickly, too). The print-out quality is still not



Xerox ColorPrint Series

Epson Print Partner 10V

Street Price: \$205

The Epson Print Partner 10V is a laser printer with a more traditional design and great performance.

Price: The print quality with this machine is excellent, and the 10-page output is fast.

The 18-month warranty includes one-year on-site exchange.

The 300S of memory is expandable to 675MB using standard S-buffers.

The letter-sized paper tray underneath the machine is adjustable using the plastic clips made. This is good for sizes up to A4.

Case: The printer comes with the letter paper tray as a standard. Legal-sized sheets are usable, but must be fed in through the manual feeder, unless a legal tray is purchased.

The menu buttons on top of the machine aren't overly intuitive. With most of the other printers having few buttons, this can be a bit overwhelming. Less flashy than most of the other machines, the Print Partner 10V looks like the single most people have when they think "laser printer" — cubical, paper hidden inside the machine, and a lot of buttons. This is both a strength and weakness. The user looking to purchase a laser printer for occasional use in a home office may be put off by the seeming complexity ("Bewee") because despite the appearance, the 10V is actually very easy to set up and use. So the other thing that familiarity will be sure to appeal to the more serious user. With speedy output, networking capability and the ability to expand the memory up to 675MB, the 10V can only live in the box, it can use deliver results in a more formal and demanding environment.

Users who will need to print a lot of high-level documents should consider purchasing all the options (up to about \$300) covered in the case file.



Hewlett-Packard LaserJet II.

Street Price: \$275

Both one of the smaller and more popular units in this roundup, the LaserJet II, delivers reasonable speed and high quality to the home user.

From The LaserJet II, is a relatively compact unit, which can fit snugly where desktop space is limited.

Despite the size of the unit, the speed is still relatively good, at 8 ppm.

The top-loading system allows both letter- and legal-sized paper to be loaded in the same manner, there is no tray adjustment required. In addition, a paper-path switch changes the output area from the front of the machine to the top of the machine with a quick flick.

HP has a program in place for recycling the toner cartridges after use, cartridges come with pre-paid return postage for the cartridges when they're empty.

Down: The paper input holder has a smaller capacity (140 sheets) than many of the other machines, which means regular reloading of the machine is used a lot or for larger jobs. Toner cartridges and the drum are integrated. This makes for more expensive toner replacement. On the other hand, drum replacement becomes unnecessary.

There is no networking option available.

Because of the lack of networking options for the II, it is best suited to the user who needs a stand-alone printer at the office, or for the home. With the top-loading system, the II has added flexibility for users who need to switch between

letter and legal using quickly and without additional hardware. With the smaller input, this may not be the best solution for high volume users, but lower-volume users should find the compactness and quality ideal.

Lasermark Optra K 1220

Street Price: \$375

Lasermark has earned a good name for both its ink-jet and laser printer lines. With good quality products, it's easy to see why. The Optra K 1220 is also a more traditional-looking machine, with high performance that is well-suited for a more formal and demanding environment.

From: At 12 ppm, the Optra K 1220 is quite speedy for the user who demands speedy output. The machine delivers

The 1200 dpi resolution is high and produces excellent output.

It's easy to set up and use. Driver installation is quick and flexible.

The paper input tray can be adjusted up to A4 size using plastic clips.

The memory is expandable up to 64MB using industry-standard SMMs.

The machine has excellent networking support.

Com: At \$375, the 1220 is more expensive than some of the other machines.

To use legal-sized sheets, the user must set the manual input on the front of the machine or purchase an optional tray.

Although the user can select a 1,200-dpi for graphic output, the standard memory will fill up quite quickly at this resolution. More memory should be added for optimal graphic output at this resolution.

One of the biggest advantages of the Optra K 1220 reveals its biggest initial limitation. Armed with a resolution of 1,200 dpi, this printer is capable of great output. However, processing documents with that resolution takes more of the printer's onboard memory than with the more common 600 dpi, sending a graphic file of the higher resolution can quickly fill up the printer's 32MB of memory. For post-job work with the larger resolution, the 1220 can be upgraded to a total of 64MB of onboard memory (it has one slot available for industry-standard memory). Printing at 600 dpi with the standard memory works just fine, producing high-quality pages at a rate of 12 ppm. As with many other top-rated printers, the 1220 requires a special tray for legal-sized sheets (about \$125 street), or the use of the manual feed.

Even with the higher price, though, the Optra K 1220's better resolution, high-quality output, excellent networking support and high speed make it a great choice for demanding users in a demanding environment.

quite as good as glossy-paper output from some of the higher-end ink-jet. Nevertheless, the all and color laser's tendency to create glossy output on standard bond paper that is very expensive-looking.

Where these models really shine is in their speed. A single letter-sized page of highest quality can take between 10 minutes and half an hour with the quickest ink-jet. In full-color mode, the Dimes Color is rated at 3 ppm (17 ppm in straight black output), and the Brother 40,000C, at an even better 4 ppm (14 ppm in plain black). Both of the machines we tested were PCL 6a compatible and both had PostScript level 3 support (the 2560p actually has full level 3 support, too). Both machines have great network support.

The bottom line? With the pricing and complexity of these machines, color laser technology is still mostly the domain of the big office. The average user will have to wait a while before the printers are smaller, easier-to-use, and less expensive.

Multifunction Units

They, once printed, but when's the telephone?

It is one of those ideas that probably would have sounded really strange a few years back, but the fast-growing area of the laser unit is the multifunction unit. It does make sense though for the small office who have a fax machine, a laser printer, and a photocopier machine when they can basically have the same technology with different twists?

The biggest immediate benefit is the cost. With many multifunction machines costing only a little bit more than a laser printer, it's a lot less getting the fax and photocopier machine for free!

Linking all three technologies together has other advantages too. By bringing the telecommunication network, it becomes easier to link a fax database with the computer, and possible to update it without poking around through business and news.

The unit also links the fax machine into a short-filing system, allowing a user to keep a digital record of all pages filed out and received. This reduces the need to have the original document handy, if it becomes necessary to re fax something. Additionally, it makes it possible to print incoming faxes and do photocopying with laser-quality output.

For users looking for a laser printer for the home office, spending a lot more money for the multifunction option is certainly worth consideration, depending on other office needs. ☐



Brother MFC-500



HP LaserJet II

Technology Trends in the Printer Market

by Jeff Evans

From the earliest days of computer printing, there have been some common customer needs that all printer makers have tried to meet: lower hardware prices, faster speed, easier installation and operation, cheaper cost of supplies per page, better text and graphics resolution and color printing at or near the price of mono-chrome printing. Over the past 10 years, the mass market for personal computer printers has provided the cash flow and the incentive to work hard on these desirable demands from users.

The result is a number of trends becoming visible in late 1998 and into 1999.

Lower Hardware Costs

The costs of the fundamental components of printers: the print engine, mechanical parts for feeding paper and the electronics, have been reduced by economies of scale and by better understanding of the basic physics, chemistry and mechanics of getting pigment onto paper.

Much of the basic print engine improvements that have been done by the Japanese, with their genius for simulation, tolerances and incremental improvement, but Lexmark, Hewlett-Packard and Canon have all contributed to advances in more efficient electronics and ink chemistry development. The result has been color printers for \$150, and 10-page letters from Brother, for example) for less than \$400.

Faster Speed

The increase in processor speed, both in RISC chips embedded in medium- to high-end printers, and in the CPUs in PCs (where processing power is often used to help speed up page processing) lower (and pushed) has seen 10 ppm become the lower limit of acceptable mid-volume laser output, and 5 or 6 ppm becoming the entry-level speed for monochrome ink-jet printing.

As well, clever software such as Adobe Print Gear speeds up laser printer output speeds. Higher end printers often have much expanded onboard RAM (up to 32MB) or more plus an internal hard drive for storing fonts, fonts, and even Web sites, as well as spooling print jobs.

Higher Print Quality

It seems 600 dpi has become the entry-level resolution for both lasers and inkjets, but now the real battle is for high-quality color output, especially on plain paper.

At the level of ink chemistry and microchips, Lexmark, HP and Epson have introduced print heads that spray millions of tiny, precisely shaped and positioned droplets of ink, each

MCC SuperScript 100

Street Price: \$440

With an eye-catching futuristic design, the SuperScript 100 is bound to please the widest of entry users, and the pricing and features should be enough to hold their attention.

Pros: With a street price of \$440, the MCC SuperScript 100 is an attractive choice for users on a budget.

At 8 ppm, the speed is quite good. The design of the machine is interesting and eye-catching while remaining functional: the front-loading mechanism has a slot for both paper and envelopes, and the user can change the paper path with the flick of a switch.

The machine runs the Adobe PostScript processor for improved performance.

Cons: Gable sheets of blank are a bit of a problem.

The construction of the unit isn't overly sturdy. While the machine would stand up to casual use in the home environment, it might be a bit fragile for a hectic office environment.

From the design of the unit, the SuperScript 100 seems to be aimed at the home user. It's certainly an interesting-looking machine, but its detachable base well-suited it would be for a demanding business environment, as it seems less solid than many of the other machines. For lighter use, though, it certainly has a lot going for it, including an 8 ppm output speed, the use of the Adobe PostScript processor and a great price point. For those users so inclined, it does come with the option of networking, too.



Clipping One

Street Price: \$200

Clipping at 6 ppm, the Clipping One isn't going to win any speed contests. On the other hand, the low cost is the most compact of the printers tested this month, and the least expensive, both of which may be big selling points.

Pros: The pricing on this model is certainly attractive.

The one-year warranty features overnight exchange.

The compact design saves space on the desktop.

The printer uses the PC's memory and fonts stored on the printer, so there's no worry about running out of printer memory.



Cons: At 6 ppm, the One is one of the slower machines in this lab test.

The true 300 dpi resolution is low. There is a software boost to 400 dpi, though, and print quality is fairly good.

Smaller input capacity means more frequent reloading during periods of heavier use. The lack of use of the PC's memory for RFPing and printing can tie up system resources. On a slower computer, that could become problematic.

The spot where the laser cartridge engages the printer is more open than with some other machines; it's possible to spill toner into the guts of the machine.

Most desktop users will probably want to take a print on the Clipping One with its limited speed, lack of networking and relatively low resolution.

But for the casual user, or the user on a limited budget (or with very limited desktop space), it offers decent output quality, and is generally easy to use. It's definitely worth consideration.

Xerox DocuPrint P8

Street price: \$345

A well-known name in the imaging business, Xerox let us take a look at two of their newest laser printers. The DocuPrint P8 has good speed, good resolution and has a dual-interface option, which makes it worth a look for users who want to share their printer with another computer.

Print: The P8 has true 600 x 600 dpi resolution, but can print in software-enhanced 1,200 x 600 dpi mode. The model has two parallel connectors instead of the usual one, which allows the printer to be connected to two computers simultaneously in a small office situation, thus could be a big benefit.

Speed is good at 8 ppm

As the printer uses the PC's memory and fonts, there is no worry about running out of printer memory for a print job.

The top-loading design allows either letter or legal to come from the same input source without adjustment. The output path is adjustable with the flick of a switch.

The three-year warranty is the longest warranty available.

Cost: Use of the PC's memory has up system resources, which could be a big detriment on slower machines.

Apart from the printer sharing offered by the second parallel port, the P8 is also a convertible machine.

For a big office, the machine probably isn't the way to go, as it lacks convertibility. On the other hand, with the two parallel ports, the DocuPrint P8 may be the perfect choice for the home office, for a standalone printer, or for sharing between two machines.



Xerox DocuPrint P12

Street price: \$1,100

The higher end of the two Xerox models, the DocuPrint P12 also comes through, where performance is also good.

Print: At 12 ppm, the P12 is one of the faster machines available in the market.

The P12 uses the Adobe PostScript processor for increased printing performance.

The paper tray is a very flexible model, extending all the way up to legal-sized sheets. The flexibility means the user can get by with one tray instead of buying an additional one to accommodate the larger paper sized.

The DocuPrint P12 comes with a three-year warranty, longer than anyone else.

Cost: The drums and toner are in its all-in-one package. Replacement costs are higher when toner needs to be replaced, but this eliminates separate drum replacement.

The price tag is much higher than other models listed because of the other features involved.

At \$1,100, the Xerox DocuPrint P12 is the most expensive of the models tested this month, but its features make it worth the extra investment. This is a formidable machine, and a welcome addition to a demanding workplace, retail home or office.



second, to create near-photorealistic images that dry quickly without smearing. There is a minimum amount of ink, to avoid clogging and wrinkling the paper. This also results in lower consumables cost per page, so more ink goes further.

Ease of installation and use

Printer drivers for Windows 95 have approached Mac levels of simplicity in many ways, due to the development of Plug and Play. There may be some continuing problems with Windows NT and Windows 95 compatibility until there is a complete range of drivers optimized for those operating systems. Once again, the Mac is showing the way with the Universal Serial Bus (USB) connector, which is used at both eliminating connectivity problems and speeding up print speeds by transferring data from computer to printer at a higher speed. The Mac is driving USB activity on the Mac quickly, while USB on the more diverse Windows platform is moving slower, but steady progress.

Lower Cost of Supplies per Page

Cost per page, especially for color, is the big scandal of computer printing. Retailer printer centers, in particular, are shocked at the sticker price and frequency of buying replacement cartridges. The latest print heads and ink formulations, as mentioned above, depend less on the page to create a good image resulting in more pages printed per cartridge, and better image quality on low cost paper.

Color inks, as well, are becoming more cheap compared to a couple of years ago due to lower supply costs. The recycling charge for color printing, however, has to be the Tonerless Printer series, which uses colored waxed ink cartridges. The company gets the black cartridge away for free, so they cost so little to make.

Color as Cheap as Black and White

This is the biggest remaining barrier to color-capable printers emerging over the black and white limit. The new generation of color inks, at around \$2,600 for a networked, lightly loaded workgroup printer, are reducing the barrier to business color printing to an almost negligible level.

As color ink jet print speeds increase, they are probably up against the mechanical barrier with increasing force. □

EDITORS' CHOICE

OVERALL
Landscape Optima X 1200

Landscape printers always show in our Lab Tests, and the Optima X 1200 is no exception. The 1,200 dpi color resolution is excellent, though a bit of additional memory needs for the higher resolution output and iCB PCL and the 12-ppm speed is top notch. The unavailability of the printer into Europe is, as does the expandability of the memory. All of these make the printer well suited both as a stand-alone printer, or one easily to deal with the needs of a small office, with the ability to handle a greater load down the road.

Sean Carruthers is Lab Test Editor for Canadian Computer Wholesaler. He can be reached at scarruths@ccw.ca

PERFORMANCE
Xerox DocuPrint P12

For sheer performance, Xerox's many years of putting their top-of-the-line show with the DocuPrint P12. While it's a little more pricey than some other machines, the features on the P12 compensate for the difference. The standard paper tray is a good example, as it can be adjusted for both of the most common sizes without too much trouble, and without the added expense of purchasing a second tray. Having the Adobe PostScript processor made also helps out the machine's performance. □



LAB TEST



Brother HL-4140



Epson Eco Stylus C100



Kodak iPrint C100



Lexmark Opus E150

Maximum resolution (dpi)

1,200 x 600 dpi

1,200 x 1,200 dpi class

600 x 600 dpi

1,200 x 1,200 dpi class

Rated pages per minute

10

10

8

10

(certified by ISO 9001 Lab Test)

Series

HL-41, HL-45, HL-47

Stylus C100, Stylus C110

Print C100, Print C110, Print C120

Print C100, Print C110, Print C120, Print C130, Print C140

Processor

8MHz Fujitsu 5140C10

8MHz Fujitsu M14700

30MHz Motorola 68030

30MHz Intel

Memory (standard / maximum)

640K / 256K

256K / 473K

1024K / 512K

256K / 512K

Accepts standard DIMMs

yes

yes

no

yes

Interface (standard)

Parallel, USB

Parallel

Parallel

Parallel

Interface (optional)

Serial

Serial, Ethernet, LocalTalk

RA

Serial, Ethernet, Token Ring

Number of installed fonts

81

48

38

32

PCL / Postscript support

PCL3 / none

PCL3a / optional Postscript Level 2

PCL3 / none

PCL3 / Postscript Level 2

Standard paper capacity

250

250

190

250

Paper sizes accepted

letter, legal, executive, A4, A5, A6, B5

letter, legal, executive, A4, A5

letter, legal, executive, A4, A5, B5

letter, executive, A4, A5, B5

Media types accepted

envelopes, transparencies, labels

envelopes, transparencies, labels

envelopes, transparencies, labels

envelopes, transparencies, labels

Task / sheet capacity

yes

yes

no

yes

Cartridge life (pages)

3,400

5,000

2,800

2,000

Duty cycle (pages / month)

30,000

30,000

5,000

15,000

Dimensions (H x W x D) (inches)

16.4 x 13.3 x 1.1

14.8 x 15.2 x 0.7

13.2 x 13.2 x 0.9

18.9 x 19.7 x 11.3

Weight (pounds)

16.2

21.5

11.5

33.5

Maximum price (list)

\$9,999

\$9,999

\$9,999

\$9,999

Street price

\$599.95

\$699.95

\$799.95

\$999.95

Power-on-to-page time

\$69.95

\$69.95

\$199.95

\$199.95

Size and cost

\$219.95

\$219.95

\$69

\$269.95

Warranty

2 years

10 months

1 year

1 year

Contact

1-800-361-4400

1-800-393-0790

1-800-393-3632

1-800-393-5833

Web site

www.brother.com

www.epson.ca

www.kj.com

www.lexmark.com



CPA



HP

Spectre x360

13.3" x 13.3" up

8

Intel i7, Win10, 128GB SSD

256GB SSD, 16GB RAM, 128GB SSD

2 TB / 1 TB

yes

Penable

Chromecast

85

PCL-A / none / Penable 10

100

Intel i7, 16GB RAM, 128GB SSD

256GB SSD, 16GB RAM, 128GB SSD

16GB RAM, 128GB SSD

yes

1,000

1,000

10.1" x 11.7" x 1.1"

10.1"

10.1" x 11.7"

10.1" x 11.7"

10.1" x 11.7"

10.1" x 11.7"

3 years

1-800-433-4333

www.hp.com



Surface

Laptop 4

13.5" x 11.5" up

1

Intel i7, Win10

128GB

16GB / 8GB

yes

Penable

yes

yes Windows 10

PCL-A / 1, 1, 1

100

Intel i7, 16GB RAM, 128GB SSD

256GB SSD, 16GB RAM, 128GB SSD

16GB RAM, 128GB SSD

yes

1,000

1,000

10.1" x 11.7" x 1.1"

10.1"

10.1" x 11.7"

10.1" x 11.7"

10.1" x 11.7"

10.1" x 11.7"

3 years

1-800-433-4333

www.microsoft.com



Dell

Inspiron 15

15.6" x 11.5" up

8

Intel i7, Win10, 128GB SSD

256GB SSD

16GB / 8GB

yes

Penable 10

yes

85

85

100

Intel i7, 16GB RAM, 128GB SSD

256GB SSD, 16GB RAM, 128GB SSD

16GB RAM, 128GB SSD

yes

1,000

1,000

10.1" x 11.7" x 1.1"

10.1"

10.1" x 11.7"

10.1" x 11.7"

10.1" x 11.7"

10.1" x 11.7"

3 years

1-800-433-4333

www.dell.com



Acer

Swift 3

13.5" x 11.5" up

10

Intel i7, Win10, 128GB SSD

256GB SSD, 16GB RAM, 128GB SSD

16GB / 8GB

yes

Penable

Penable 10

85

PCL-A / 1, 1, 1

100

Intel i7, 16GB RAM, 128GB SSD

256GB SSD, 16GB RAM, 128GB SSD

16GB RAM, 128GB SSD

yes

1,000

1,000

10.1" x 11.7" x 1.1"

10.1"

10.1" x 11.7"

10.1" x 11.7"

10.1" x 11.7"

10.1" x 11.7"

3 years

1-800-433-4333

www.acer.com



Performance

Test-Driving the 100MHz MOTHERBOARDS

by GREGORY BRONITT

Motherboards, more than any other feature, define the reliability, capabilities and limitations of a computer. They are the foundation on which we build.

Many system builders, however, look for boards that can help them put together price-competitive systems. In fact, price remains the primary determinant of the popularity of motherboards. But a growing number of savvy shoppers now understand technical details, such as why the transfer rate of an EIDE drive is twice as fast as that of a PIO mode 4 or DMA mode 3 drive, why an LX motherboard supports 50MB/s but a BX board doesn't — even the nuts in the heart of the TX chipset's limited cacheability. Indeed, the "premier" base has moved quickly to embrace the latest generation of Socket 7 and Slot 1 boards, and 100MHz has become a checklist item on many shopping lists.

At least until motherboards based on the Intel iX3 chipset — with support for the Slot 2 design of the Xeon CPU, duplicate the current generation of motherboards, the 400HX is the chipset of choice for Slot 1 processor fans, while "Super 7" is the buzzword for the BX crowd.

In this report, we look at some of the key features of the latest 100MHz motherboards from around the world. See our specification charts at <http://www.pc.org/news/motherboards/> for feature lists and technical details.

ADAPEN MX6E Plus

<http://www.adapen.com>

A company that impressed us with innovations was ADAPEN — a January '98 winner of a COW Technical Excellence award for its AX6E board.

In addition to providing what is with the world's first battery-less motherboard design (although this claim might seem a bit dubious in light of the fact that a lithium battery is still supplied, it uses a special EEPROM to hold CMOS and CPU setup data), and the ability to "suspend to hard drive," the company's 5143 MX6E Plus boasts over-voltage protection circuitry, a more efficient synchronous switching regulator thanks to an MOS FET design, jumpless CPU setup and other innovative features. It's a pity that Pin should during "Direct mode" stopped is not supported.

As you might expect from a company that is a major player in the internal modem market, the ADAPEN motherboards have better-than-average support for modems. Although most of the boards in this review feature "modem ring on" support, the Super 7-based AX39Pro (SL79) and Slot-1-based AX6E Plus boards (SL99) provide a feature the

Glossary:

AGP — *Accelerated Graphics Port*. makes use of *Advanced Graphics Port*, which supports 100MHz Front Side Bus (FSB), Accelerated Graphics Port (AGP) and all current Socket 7 processors.

Bus Master IDE (DMA, master) — a Bus Master IDE device transfers data without interrupting the host CPU. You'd need a Bus Master IDE driver and a Bus Master IDE HDD.

DRAM — *Dynamic Random Access Memory*. They're 144-pin chips. 100MHz boards require speed RAM, integrated "70C50," according to Intel specifications. Single-sided DRAMs are available in 16, 32, 64 and 128MB, double-sided are in 32, 64, 128 and 256MB capacities.

EDO — *Extended Data Out*. These are special DRAM modules with nine chips per side (standard eight chips per side plus one EDO chip). They usually require setting the BIOS' "Chipset Features Setup" data sheet, on some boards we've seen, EDO is not supported under 55/133MHz bus speeds. Consult the motherboard manual.

EDO — *Extended Data Out*. This is a type of RAM commonly found in Pentium-class machines from 1995-1998.

EDM — *Extended Data Out*. This is a type of RAM commonly found in Pentium-class machines from 1995-1998.

PIO Mode 4 — *Programmed Input/Output*. The hard drive transfer mode uses only the clock edge of IDE command signal to transfer data, resulting in 16.6MB/sec transfer rates. See also UDMA/DMA/PIO.

SDC — *Single Edge Connector*. The Predator II "Slot 1" slot.

Slot 2 — The Xeon slot.

SPDIF — *Sony/Philips Digital Interface*. This is a standard for digital audio input/output support, providing a digital link between the motherboard and devices such as a CD player, amplifier or DAT recorder.

SDRAM — *Synchronous Dynamic Random Access Memory* chips are generally slower with higher pin density than EDO chips.

UDMA — *Ultra Direct Memory Access* is a term used to refer to the latest generation of Enhanced IDE drives, with support for transfer rates of 33MB/sec. This is double that of PIO mode 4 or DMA mode 3.

made up to 133MHz. Note, however, that the Intel AGP card only supports Intel chips, such as i8X, iX or BX chips. It does not support VIA, SIS or ALI chips at present.

The company says the 3AMVP3 is especially designed for AMD K6-PR300 66MHz (frequency) and K6-2 1D (100MHz frequency) CPUs. In fact, a hand-soldered unit in our review unit's manual showed a late addition: support for AMD's K6-2 1D PR300, running at 95MHz, based on a 3.3u multiplier. Budget savings for AMD K5, Intel Pentium and Cyrix 6x86 CPUs are also provided. The system uses the Award BIOS.

Lucky Tech SM-PSEX

Not to be confused with Lucky Star is Lucky Tech, its derivative SM-PSEX is one of the smallest motherboards looked at in this review, with only two DIMM sockets complementing its assortment of one AGP, three PCI, and three ISA slots. But it comes nicely packaged with a good manual, a full complement of cables and I/O ports, including a single PS/2 port mounted on a slot cover. As with a growing number of low-cost boards, a folding retention mechanism allows the use of a PIII or Celeron CPU. The 28-page manual is sparse on instructions, but provides the essential info. As the name implies, it is based on Intel's 486MHz EX chipset. Both AT and ATX power connectors are provided.

Mitacok M5700S

Everest Technology
604-777-9000

As one might guess from the name, a motherboard with optional audio from Mitacok led the best sound-related features in this roundup. The M5700S motherboard features volume up/down

and CD-ROM audio connectors, plus ports for mike, line in, line out, SB-Link and joystick.

The Yamaha YM704E audio chip supports full-duplex, 1D audio, variable sampling, 64 voices, Standard AG, DLS (downloadable sound) Level 3, and supports Microsoft's DirectSound/DirectMusic spec to deliver hardware audio acceleration. Sound drivers and applications are supplied on CD-ROM.

The board which sells for \$158, is made in Taiwan and is OEM'd by Chintech.

Soltek SL-67B

No, the busy price for documentation must surely go to Soltek, which includes only a half-sheet of paper documentation, delivering the rest of its user manual on CD-ROM. The Soltek SL-67B provides plenty of expansion opportunities, though. It includes five PCI slots, four DIMM sockets and relatively easy-to-configure DIP switch configuration of clock and bus ratio selection. We found ourselves concerned about the absence of a BIOS manufacturer's logo on the BIOS chip, but it is, in fact, an Award BIOS, after all.

And More...

Transcend's TS-ARX (<http://www.transcend.com>) board includes a BIOS feature to boot from AGP first — a capability lacking in a surprising number of boards in this test. This means that a Windows 95 system with two videobards will allow the AGP card to be the primary display (with a PCI video card as a secondary, detachable display).

The Shuttle HDT-661P (<http://www.spacewalk.com>) also elects to provide the complete manual on CD-ROM, but at least provides a brief orientation guide on paper. It is bundled with Intel's LDCM, but otherwise stuck in an unamenable in feature.

DataExpert sells motherboard under the Global Multimedia brand. Its MB0440 is one of the few motherboards in this test that includes onboard sound, thanks to its Yamaha YM715 audio controller. The company says the mode is compatible with Sound Blaster 16 and Windows Sound System and supports 3D surround sound.

Gateway's SYPS (US262, <http://www.gateway.com>) is an AT format Super 3 board with both AT and ATX style power connectors and four PCI slots. As the name implies, it is based on the MVP3 chipset.

Micro-Star International Co. Ltd.'s MS-6189 (Phone: 886-2-2244-3399) is an ATX-format BX-based motherboard with solid documentation and a competitive feature-set. It uses the AMI BIOS and supports features many shoppers are disgruntled, such as Fast-Step on stepped mode. As you might expect from what the U.S. Computer Resource News characterizes as the sixth largest PC motherboard manufacturer in the world, a nicely prepared manual includes better-than-average CPU and RAM installation guidelines and illustrations.

Meanwhile, MSI's MS-6189 claims to be the first motherboard to support the AMD's 93MHz K6 2 at a 95MHz bus clock. It supports the Desktop Management Interface (DMI), allowing system administrators to more easily record installed settings and specifications, and features a number of other useful BIOS functions, including compatibility with LS-120 and Zip drives, and boot support for CD-ROM and SCSI hard disk. Trend's Chip Away Virus software in the BIOS is suggested by the inclusion of a bundled copy of Norton Anti-Virus. ☐

Giovanna Bernard is Editorial Director of Canada Computer Paper Inc. He can be reached at gsnow@tsp.ca.

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Now! He

3D SOUND, VOICE INPUT, QUALITY SPEAKERS DRIVING PC AUDIO MARKET

By Jeff Evers

ear This!

The personal computer audio segment of the computer market has quickly blossomed throughout 1998 from some major technological advances, product introductions, corporate consolidations, and the continuing convergence of computers with other media such as telecommunications, television and consumer electronics. The computer audio market has become a fairly clearly segmented market for PC makers and resellers in recent years, with a veritable divide between minimal audio (in business desktops and entry notebooks), commodity audio (in budget-priced home and school PCs and mainstream notebooks), and the multi-plate segment (composed of several distinct sub-segments, including games software power users, professional and amateur musicians, home theater enthusiasts, voice input users, and business multimedia users). A formerly niche and rare applications area — voice input has surged in popularity to become a mass market in 1998. This is due in part to the introduction of really good voice recognition software from IBM, Lernout & Hauspie and Dragon Systems. Plus, the increase in processing speed and RAM in the average new PC enables it to handle the extreme demands of voice input. The rate of growth in voice recognition can be expected to continue to increase rapidly in 1999.

Follow the Money

Resellers can't expect to make much money from the lower budget parts of the PC audio food chain, but they should be able to qualify customers who fit into the end of the market, and supply their needs efficiently. The sub-\$1,000 home PC is not a high-profit sale, but once new consumers have been bitten by the computer bug, they are likely to come back for additional software and system upgrades. Audio related products are one of the most common post-system-purchase choices.

Once customers want and spend well above the budget however, there is good opportunity for resellers to upsell clients to more satisfactory audio solutions, and make higher margin sales in the process. The customers who drive the audio market, both in terms of stimulating new product development and offering profit opportunities, are gamers, educators, audiophiles, music "professionals" (serious enthusiasts of audio, but not professional or semi-professional), musicians, and home theater enthusiasts.

The State of the Art

In 1998, a high level of multimedia performance is standard in personal computing. The Microsoft Windows 98 and Mac OS 8 operating systems have software standards for the integration of text, image, sound and moving pictures. That has resulted in the publication of a host of software titles ranging from games and interactive training, to mainstream office suites and Web browsers. Audio technology has steadily improved in quality and simplicity of use, especially in the area of 3D sound, where Creative Labs has become a trend-setter through both in-house development and acquisition of third-party technology. The continued progress of the DVD (Digital Versatile Disk) format has encouraged closer integration of television with computers, and given added incentives to acquire audio playback capability to match the upsets new standard for digital video. Most current DVD kits, and many graphics cards such as the ATI All in Wonder Pro, feature NTSC video output so that DVD movies can be played on a TV monitor as well as a computer monitor. Really good voice input software from IBM and Dragon Systems has created demand for noise reduction microphones and high-quality sound cards and for the high-powered PC hardware required to get top performance from voice input systems.

Hardware

A basic flaw in PC audio is the nature of the PC itself, a box full of electrical components which was designed by engineers, not musicians. According to a position paper by leading PC speaker maker After Lasing: "The inside of a PC is a hostile, electrically noisy and unshielded environment. Once the sound card's DAC (Digital-to-Analog Converter) converts a digital audio stream from its native digital format to an analog signal, the signal becomes exposed to Electromagnetic Interference (EMI) as it flows downstream from the DAC to other analog components in the signal chain, including the card's pre-amplifier and power amplifier sections, speaker wires, and the speaker itself. The end result is an unacceptably high residual noise level in the output signal, plus transient noises which occur unpredictably as hard drives, CD-ROM drives, video cards, or other devices perform operations across the ISA bus to which the sound card is connected. These cumulative degradations become immediately apparent when the line level (or post-processed) signal from a PC sound card is used to drive a home stereo grade system equipped with an onboard state-of-the-art amplifier and full range speaker system."

In practice, this means that the same sound card and speakers may produce very different results when connected to different PCs. Realization that not every happy audio customer may have to find out by trial and error which PC models are less noisy.

The Audio Food Chain

For all the progress in the products available, audio remains one of the more commonly neglected areas of computer technology, from both the end-user perspective as well as from the world view of many PC makers and resellers. Most PCs come standard with cheap, poor quality speakers that mask the often excellent audio output capability of even moderately priced audio cards and CD audio data files. Most retail sales rooms are noisy, which makes it difficult to hear PC audio output clearly enough to judge its quality.

The average PC buyer still remains more tolerant of low-quality PC audio playback than if they were shopping for a consumer stereo system, but the computer audio playback and synthesis quality that cost thousands of dollars in the mid-1980s is now available for under \$300.

The Sweet Spot

Computer audio remains low: the home PC power user — typically a male aged 15 to 40, who is willing to spend fairly freely on leading-edge audio for entertainment purposes. Power users often buy a new PC that is loaded with graphics and audio features.

then come back to upgrade speakers and sound cards as advancing software opens up new possibilities for ever more demanding audio applications. This premium market wants high-quality stereo sound and increasingly wants immersive 3D sound, mainly for gaming. According to certain computer retailers, After Lasing and Cambridge Soundworks speaker kits and the Creative Labs AWE64 are among the popular brands.

Music enthusiasts are another potentially lucrative market, but selling to that customer type demands well-trained staff, considerable demonstration capabilities, possibly a fair amount of in-store inventory, and a high level of service and support. This makes the prosumer, audiophile or musician market a specialty area that is often served in major cities by one or two stores that combine PC audio with digital music and stereo system sales. Examples of the less-standard products desired by musicians include MIDI interfaces, audio cards with wave table synthesis, high-quality speaker sets (with large, higher wattage speakers and usually a sub-woofer unit), various input devices (keyboards, trackballs, high-quality sound digitizers, microphones), music software and recording equipment.

Come Here, Mister Watson

Voice input may possibly become a viable alternative to the keyboard and mouse for entering text and commands into computers over the next few years. Right now, there are viable voice input solutions for many PC users with particular needs. Some business professionals — including doctors, radiologists, lawyers and journalists, teachers and students, and disabled people — are gaining useful benefits from voice input right now. Voice recognition is still not quite plug and go, however. For one thing, the PC being used has to be a pretty current model. Pentium 300MHz with 64MB of RAM is a decent starting point. Also, the PC has no sound card and need to be free of electromagnetic interference. A common problem for voice input users is extraneous noise inside the PC case, which interferes with the clean digitization of speech, and consequently degrades the quality of the speech recognition. As well, good-quality noise reduction microphones are also necessary. Voice recognition depends on a long chain of components working together in optimal quality: processor, operating system, sound card, make, human speaker, PC bus, cabling, and software. If any link in the chain is weak, then the process may fail.

Voice recognition is really still in its infancy (an infancy that has persisted for more than 25 years, since IBM began its research into voice input in the early 1970s). The Royal Bank of Canada has recently demonstrated the potential of interactive audio with an award-winning audio banking machine, which allows visually impaired customers to interact via an interactive voice system. According to Rick Hakes, of NCR, the company which developed it, "Technology is the great equalizer. The audio ATM has the potential to allow more than 50 million people around the world who are visually-impaired, as well as 1.4 billion people who can neither read nor write, to have an affordable access to self-services — when and where they need it."

The Future: Hollywood at Home, and on the Web

Somehow similar to the power user is the home theatre enthusiast. Instead of being PC-centric, however, the home theatre market is diverse, the main focus is typically on the "movie screen," a large format CRT television set, or a projection TV. The home theatre sound system is typically a multiple large and more expensive than a PC speaker set.

The PC is an add-on to the current home theatre.



perhaps, used in conjunction with a NTSC video card to allow the PC display to be viewed on the large TV screen. DVD is becoming the preferred standard for high-quality video playback, either on a computer screen or a TV set. Home theatre owners may prefer to get a stand-alone DVD player (at about \$600 to \$1,000) instead of using a PC mounted with a DVD drive. With over twice the maximum vertical resolution of regular cable or VHS signals, the video output of DVD can be amazingly superior to regular video. The audio quality of DVD is also far superior to cassette, broadcast or cable audio. Featuring full 16-bit CD audio quality, with all the flexibility of a digital medium: multiple languages, voice-overs, and closed captioning. As well, Microsoft is trying to lead the way in merging television with the Internet with its Web TV service.

More change is on the horizon. In the next five years or so, digital video broadcasting will begin into the home, from cable or satellite and over the same period high-speed Internet connections will come to many homes.

Some Contenders (A partial list):

Creative Labs (<http://www.creative.com>):

Creative Labs is the company responsible for bringing order to the PC audio jungle over a decade ago with its SoundBlaster audio format. Today, "SoundBlaster compatible" is the code word for minimum compatibility of any PC sound card. Creative has been both an aggressive innovator and purchaser of audio technology. Current offerings include the AW554 sound card, and the SB380 two-piece speaker set, each speaker containing a woofer and tweeter. Creative Labs has established the term "Environmental Audio" to describe its corporate goal of creating digital audio systems that aim to reproduce the experience of being in a real 3D environment.

In the age of DVD, Creative has offered one of the best DVD upgrade kits, the DVD Encoder Duo3, which is a bundle of a DVD drive and a MPEG I/NTSC-output card combo.

Creative also sells a bare DVD drive, unbundled from the graphics card—as an OEM component (current CPUs are now powerful enough to do MPEG II decompression via software, such as ATI's MPEG II driver, without dedicated hardware cards). Among Creative's recent technology acquisitions are its purchases of Silicon Engineering, Inc., a multimedia chip designer, the NoMedia group of OPT Inc.—renamed Estivo Inc., devoted to developing new technologies, Biquap Corp., one of the key audio chip and musical instrument developers, and Cambridge Soundworks Inc.: a high-quality speaker maker. Creative has also worked closely with many of the top entertainment software companies, such as Electronic Arts, to ensure maximum use of its new audio technologies as top-selling new games arrive. As if that wasn't enough, the Creative Modelo line of graphics accelerators is one of the few serious competitors to ATI in terms of price performance. Creative has also announced a recordable DVD product—the Creative PC-DVD RAM, expected to sell for about \$150.

Diamond Multimedia (<http://www.diamond.com>):

Diamond is a multimedia card maker with fingers in several technology pies, including graphics, audio and telecommunication cards. One of its top product offerings is the Diamond Multimedia Member Sound M300 (\$199), a Windows 95-oriented card with 32 simultaneous voices and DirectSound 5 compatibility, but not SoundBlaster compatibility.



SantaCack (<http://www.singgroup.com>):

SantaCack offers a line of generally well-featured and low-cost Pina Technologies sound cards for PC residents and end-users, including the recently introduced PF-3638 and PF-3625 models. According to Robert Chan, SantaCack's marketing manager, SantaCack intends to continue to provide a "two two punch" impressive performance at a competitive price. The PF-3638 Schenker 64 A/D-I PCI Writable card is a 3D device that uses the latest aerial interactive professional sound, which supports both the DirectSound and DirectSound 3D audio standards, currently supported by many games software publishers, to create realistic sound environments. The PF-3625 Schenker 64 PCI Writable concentrates on delivering high-quality musical synthesis with the ability to handle up to 4MB downloadable writable samples. The cards are priced for mainstream PC users at street prices of \$49.99 and \$42.99 respectively.

Sony (<http://www.sony.com>):

In addition to being a world leader in consumer electronics, Sony is a major force in PC audio. The company has recently been strengthening its position with a mix of "entertainment" and "professional" premium audio offerings. The new Sony VAIO line of notebook PCs, announced in July, features very advanced, well-integrated audio digitizing and playback features. On Aug. 16, Sony of Canada Ltd. announced a new group of Sony Professional Certified Sound products aimed at the corporate, professional musician and serious home entertainment user.

Over 30 new products are scheduled for release in the fall of 1995. Among the products announced for the Canadian market were an SRP-V110 Audio mixer, a rack-mounted live performance mixer for up to 10 mono and eight stereo inputs, the DPS-V35 Multi-effect Processor, and the MDS DRE1 HardDisk Recorder. New DAT recorders, amplifiers and mixers have also been released, smudging the price/performance line between the consumer and professional. According to Sebastian Sosa of Sony Canada: "Home video owners, musicians and producers alike can now enjoy the benefits of a professional DAT (Digital Audio Tape) recorder in a highly affordable price." Other new products include a line of SRP consumer speakers, which start at about \$400, delivering "smooth, extended frequency response and substantial power-handling levels, making the units ideal

for a range of public address, sound reinforcement, audio/visual presentation, theatrical and conference applications.¹⁰

Voyetra Turtle Beach Inc. (<http://www.voyetra.com>)

A company with a long record of innovation in both audio software and hardware, Voyetra publishes musical software such as MusicWizz Plus, a computer composition program; Digital Orchestrator, which allows users to write, edit and produce complete multi-instrumental compositions on a computer; Teach Me Piano, an interactive multimedia piano instruction system; Orchestrator Plus, a professional MIDI recording studio program (usable either by a professional or a serious student or amateur); and many other creative, instructional and sound library titles. On the hardware side, the company is a world leader in sophisticated yet easy to use musical hardware ranging from the \$149 MultiBee Surround 64, a versatile synthesizer and 3D audio card, to the \$899 Postack Project Studio, "a full featured digital audio, MIDI and production solution for Windows."

Yamaha (<http://www.yamaha.ca>)

One of the leaders in electronic music and audio since its inception, Yamaha is a leader in PC audio as well. Its current offerings include the WaveForce 1920G PCI sound card for Windows-compatible PCs. For a suggested \$149, the WaveForce 1920G is aimed at home music enthusiasts and gamers, using 3D positional sound technology to create an immersive audio experience. The 1920G incorporates waveable synthesis, the most realistic and flexible sound creation method, with 2MB of WAV ROM per synthesizer, and 21 drum kits and 676 instruments. Additional sounds can be downloaded for use by the card, a feature that can be exploited by software developers or end users. A 128 poly-phony-voice Software Synth is included with the card, along with a Yastoon 3D Multimedia Player, a software application that ensures the card is compatible with the many audio and MIDI file formats currently in use.

As well, there is a MIDI Sequencer and Wave Editor included, with a set of internet musical tools. To meet the demands of gamers, latest versions of the Final Fantasy VII and Demon Star games are also included. The WaveForce 1920G joins a complete line of professional and consumer electronic musical instruments, peripherals and hardware that continues to be one of the most popular in Canada. An

example of Yamaha's speaker offerings is the two-piece YST-M15, which produces very clear playback for a street price about \$130.

More Contenders:

Altec Lansing (<http://www.altec.com>)

Altec Lansing has been a leader in compact, high quality speaker sets, often comprised of two desktop speaker cubes and an under-desk subwoofer. Altec has also been a leader in the bookshelf speaker revolution, which promises big sound from compact speakers. Current offerings include the ACS45 three-piece speaker set. Altec Lansing has also come out with one of the first USB speaker sets: the ADA40 Digital PowerCube, a three piece speaker kit. Altec Lansing has a vast array of different speaker set packages to choose from, ranging from budget to audiophile quality. Its products are available via the Web as well as through distributors, and preinstalled in many PC makers' systems. The company also sells a bundle of the Creative Labs' SoundBlaster AWE64 and the PCWorks three-piece speaker set.

Cambridge Soundworks Inc. (<http://www.AJL.com>)

Another leading brand in the three-piece, compact premium speaker market, Cambridge has one oddity that tends not to endure these to reviews: they sell their products direct or by phone. They also sell to OEM computer companies and their products tend to be seen on store shelves bundled with premium power user's PCs.

JAZZ Speakers (<http://www.jazzspeakers.com>)

This company offers a two-speaker set: the JAZZ JS-300 3D, which offers good general sound playback, but strains to accommodate 3D sound without some loss of music playback quality.

JBL Consumer Group (<http://www.jbl.com>)

JBL has speaker sets such as the JBL Media2 — L-shaped speakers with easy to operate volume, bass and treble controls.

Labtech Enterprises (<http://www.labtech.com>)

Labtech offers a range of speakers, including the LCS-3230, over 10-watt speakers with 3D spatializer circuitry, for about \$140.

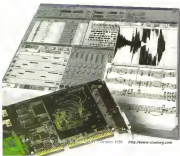
Roland (<http://www.roland.ca>)

Along with Yamaha, Roland is a pioneer in electronic audio, with a particularly strong presence in the Canadian market. Roland is a major supplier of MIDI keyboards and interfaces and offers some support values in speakers, including the Roland M-1 twin-speaker set, a very fine product with a street price around \$130.

ScenLab (<http://www.scenlab.com>)

ScenLab, an importer and distributor of audio products manufactured in the People's Republic of China, has been active in the Canadian market since 1992. The company is ISO 9002 certified and currently offers a range of over 800 multimedia and audio products, including the CS-50 notebook speakers, and the CS-5W2 and CS-5W3 Sub-Woofers.

ScenLab also carries a range of headphones, earphones and microphones for applications including computer/telemetry integration, voice recognition, mobile cellular and videoconferencing. ScenLab's products are widely used by system integrators and PC makers in the Canadian market. The company is looking to further expand its channel presence in the Canadian PC industry. ■



Contemplating Alpha; Warming to Celeron?



by

Allen Zisman

This column was recently called to task by reader Ken McKinnon, when he wrote:

...here is one very important CPU you failed to mention. The DEC Alpha chip is by far the most advanced CPU in the marketplace today. I don't mind Pentium chips, but the architecture suffers from too many bottlenecks. I know that Microsoft favors the Alpha chip when it comes to writing its 64-bit (or 128-bit) version of Windows NT. The choice in the future will not be Celeron, K6, PowerPC or MMX. The choice will be Pentium II, Alpha or maybe Pentium III."

There have been questions about the future of the Alpha for a long time. It's seemed like this powerful processor was Digital Equipment's best-kept secret. This spring, as part of the settlement of mutual lawsuits between Digital and Intel, Intel purchased the Hudson, Mass.-based Alpha fabrication plant for \$357.50 million.

While there has been some concern about Intel's commitment to manufacturing a competitor's CPU, Digital (now owned by Compaq), retained the right to license Alpha technology to other companies and has done so, with AMD using it to produce a K6-III-like line, while Korea's Samsung has licensed the processor itself.

The current speed champion is the Alpha 21264 processor, which, by utilizing out-of-order code execution, manages to be twice as powerful as the previous Alpha 21164 model running at the same speed. Digital's Aaron Branch, quoted in the June 1998 issue of *Byte* magazine, predicts that the 21264 will be nudged up from current 600MHz speeds all the way to 1GHz speed within two years, and will offer double the integer and triple the floating point performance of Intel's next generation Merced processor (All that on a chip that's half Merced's size, produced on the same 0.35-micron fabrication.)

In fact, Alpha may hit 1GHz speeds even sooner than that. The Compaq/Samsung subsidiary, Alpha Processors Inc. (API), plans to bring out a model at that speed in 1999, according to a June 23 report on-line by *Cnet News*. That source also reported that the company expects to move to a more efficient copper process, similar to the one developed by IBM.

Like Intel's upcoming IA-64 Merced, which is now not expected before the year 2000 at the earliest, these Alpha models are already 64-bit processors. The problem is software: Alpha systems can run 64-bit Unix operating systems, but Windows NT, while available in a version optimized for Alpha, is currently limited to 32-bit support. Microsoft is working on a 64-bit Alpha version (and is planning to produce a 64-bit Merced version as well). NT64 is expected shortly after the release of 32-bit NT 5.0. According to API's chairman, Dr. Danny Chen, even the 32-bit NT 5.0 will provide support for 64-bit technology.

There is an expectation that Compaq will build on its ownership of the Alpha by producing components, including chipsets and even motherboards, that can work with both AMD K6 and Alpha processors, expanding the potential market for Alpha. Such developments could lead to an expanded line of Alpha workstations. There were fears

that Compaq only purchased Digital for its support network — the company has seemed intent on promoting Alpha as a high-powered, 64-bit workstation solution that, unlike Merced, is here now.

However, all is not rosy with Compaq and Alpha. With Alpha-powered machines representing a mere five per cent of the NT workstation market, Compaq has recently cut its support for co-sop marketing of Alpha-based products.

Alpha is still not used in the computer mainstream. Compaq's XP line, for example, will be selling between US\$5,000 and US\$10,000.

Stepping back from the high priced, high powered workstations, we need to take another look at Intel's Celeron. Initially, we looked the launch of this low-end chip disapprovingly. Its lack of an L2 cache resulted in less performance than competitive products from AMD and others, or even compared to Intel's Pentium MMX.

But that wasn't the end of the story. Reader Aaron Holstad pointed out:

"What is interesting is that Intel market the Celeron with the same core as a Pentium M 400. But, the Celeron is a 66MHz FSB (front side bus) chip, compared to the 100MHz FSB P-M 400. Intel uses different branding schemes, which lists the Celeron as 66MHz. Take away that ground (pin 621) and voila, a Celeron running at bus speed 100MHz. Also, when you screw with the voltage and multipliers, you have a Celeron running on a bus speed of 100MHz at 444MHz (that's right, almost 450MHz!). Don't believe me, check <http://www.kommodore.com>. Thousands of people are doing this. They get 330MHz performance for the price of just a little over \$150. I've had mine running at 400MHz for around eight days, no crashes or hangs."

So hardware hot-rodders like the Celeron because it can be over-clocking to no-faster than its initial setting. And it turns out that many gamers have found it works for them, as well. Many popular games make little use of the Level-2 cache, so Celeron's lack doesn't hurt them. And the Celeron has the same floating-point unit (math-coprocessor or FPU) as the Pentium II, which is superior to the FPU in the classic CPUs. So it offers the most bang for the low end buck for Doom-players, as reader Art Prater pointed out.

Finally, in August, Intel released a pair of new Celeron models, with Level-2 cache. The Celeron 300A and 333A include 128KB of cache compared to the Pentium II's 512KB (but while the Pentium II's cache runs at half the CPU's speed, these new Celerons run it at full speed. Less cache, but faster. As a result, on some tests, the new Celerons score as fast as the same speed Pentium II, but at a considerably lower price. <http://www.intel.com>

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Doing it Right, in Retail

by Paul Weisberg

You can catch David Neal everywhere in the road driving impersonally in Northern Ontario between his computer stores. Or, when the winter sun is with a vengeance, he ends up flying all over to keep on top of his fast-flung businesses, situated in places like North Bay, Timmins, Sudbury, New Liskeard and Sault Ste. Marie. He gives further expression: "We want to totally blanket the north."

Recently his operation, Neal The Computer Store, was the recipient in the small chain category of Microsoft Canada's second annual Golden awards, given to software retailers for their "leadership in the art and science of retailing."

Why are the people who sell PC systems not known for being good retailers? The litany of complaints is familiar. Store staff tend to be young people in love with the technology, but poor at communication with the public and understanding their clients' personal business requirements. Or they might lack sufficient product knowledge and are paid purely on the basis on how many boxes they push out of the door, not on whether they are the right products for their customers.

Neal suggests that the constant focus on price-cutting, especially among the big box stores, has had a detrimental impact on his trade. "The problem in the computer industry is they have become so tied up with the price issue because of the big box retailers. And everyone is always concerned about having the best price in beating [them]."

Yet, Neal feels that only about a third of customers are really interested about price. "Generally, consumers are concerned about the other things that we infuse about — service, quality, the professional staff."

The winner in the small chain category attributes his success to a number of factors including a comfortable setting in his stores, no blaring rock music that keeps people on edge and devices that allow customers to try out some products.

But at the top of Neal's list is employing mature sales professionals who are continually trained on the latest products and offer service. "We don't have young 18-year-old kids working in our stores," he says. "Staff have been here for three to five years; they are well paid."

Avoiding rapid turnover in retail is especially important in these smaller cities and towns in Northern Ontario where face-to-face contact is still valued, adds Neal, whose operation has several divisions — computers, communications, Internet service and after-sales support. "When you [as a customer] come back in six months, I will be the same guy you will be dealing with." Neal estimates that 60 per cent of his clients are home users — a category that for him includes the expanding small office/home office market.

SOHO continues to be a seriously neglected market in computer retailing despite all the rhetoric in the industry about importance of the home office, says Bob Pritchard, president of Kingston, Ont.-based R.J. Pritchard & Associates. His observation is that consultants or the self-employed (who work alone or maintain a staff of two or three people) have difficulty accessing configuration services and tech support in the channel. It is hard for them to obtain answers to such basic questions as "How do I set this up?" and "How do I make these things work together?" or "What is the best accounting package to use?"

"One of the ways of addressing this is for the reseller to provide that level of service on a walk-in basis. You ask them, they walk away with the answer, and probably with some software bundled. Services could be a separate line item on an invoice," Pritchard says. He believes that the computer industry has a long way to go to improve its retail component. He traces the problem to the focus by the top PC manufacturers (including Compaq, IBM, Hewlett-Packard and Apple) on the well-heeled distributors and dealers, which target the profitable high-volume corporate market. The sole exception was Priced Bull, but that has slipped away since the relationship with NRC, said Pritchard. Close PC manufacturers have filled this vacuum. "You are

now left with none of the major vendors doing a real good job of retail. It is up to the retail stores, the Future Shops and Computer City, to do that in spite of the manufacturers."

Pritchard suggests that the small office/home office customer is likely to receive more sympathy and attention from a small computer reseller, since they are both in the same boat, business wise. The one bright spot, he adds, is that these outlets, which gross \$1-million in sales or less, constitute the majority of PC sellers in Canada, where the super computer stores have not taken the kind of stranglehold witnessed in the U.S.

Nevertheless, David Marcus, the new head of IBM Canada's retail consulting practice, says a recent demand for less loyal and financially prudent buying public is radically altering the traditional way that all products from clothing to computers are bought and sold. Whereas the store drawings in Canada, the repackaging of traditional department stores like Eaton's and the competition from the large U.S.-based operations, particularly Wal-Mart.

In the PC industry, the Dell model of direct PC purchases and the real possibility of

electronic commerce does not mean that the bricks-and-mortar storefront will disappear, according to Marcus. Instead, the computer store will be one of various ways to do a system purchase. "Retail is not dead; it is just one of the channels," Marcus agrees with David Neal that more professional sales reps in the computer stores offering a "value proposition" to their customers is absolutely necessary. He draws an interesting parallel to the much maligned automobile dealer who used to be able "to sell you ice in winter." "They are trying to move away from being car salesmen. Instead, they are professional sales people who are not just there to close the deal, because that is how you earn your pay packet."

A study on the Canadian retail industry by IBM Corp. global vice-president Daniel J. Swenney asserts that a high level of customer service does not necessarily translate into lost of sales reps on the floor at a store. He suggests that informational kiosks displaying the latest product knowledge and easily accessible for the customer could replace some of them.

Meanwhile, John Lambert, director of purchasing for Computer City in Canada, says that computer retailers are being forced to alter their direction because of vanishing hardware margins. Those efforts range from offering the strangest services like an Internet call, to a more services-oriented approach such as build-to-order and a special counter for neglected Macintosh users. He estimates that a third of his operation's business involves outbound sales calls.

Toronto retail consultant and president of TrendSpeak International, Jane A. Pignone, welcomes the consumer-friendly approach. She says it's preferable to the "agency and prag" approach, traditionally practised in the PC industry. "Spend a lot of knowledge and information around the world and hope to God that it sticks." ■

Paul Winberg is a Toronto-based journalist who specializes in high-technology reporting. He can be reached at pwinberg@waterloo.com.

"We don't have young 18-year-old kids working in our stores," he says. "Staff have been here for three to five years; they are well paid."

— David Neal



Reading up on TCP/IP

by Stephen Barakli

Networks can be quite intimidating due to a plethora of new terminology and buzzwords. Baste your head if you find it hard to keep up with the changes. Raise your hand again if you're intrigued by the Internet and its underlying technologies. Whether it's the Internet or your own corporate intranet, the backbone to most networks is the TCP/IP suite of protocols.



Title: *TCP/IP for Dummies, 2nd Edition*
Authors: Candace Leland & Marshall Wilemsky
Publisher: IDG Books
Cost: \$34.99

Description: *A behind-the-scenes beginners' guide to what makes the Internet and most networks tick. A must read for managers and those involved in technical sales support. This book is highly recommended for those who want a solid foundation in the Internet, networks and the TCP/IP protocol suite.*

Rating: A

TCP/IP is not the simplest of protocols. However, if want a closer look at what happens behind the command lines and graphical browser interfaces, then you must understand this protocol suite — at least in principle. For these reasons, we highly recommend *TCP/IP for Dummies*. It's well-written, designed for the novice, and can help immensely in taking the sting out of learning TCP/IP concepts.

The book is friendly in its approach, often humorous, and a fast read. It clearly and clearly explains complex tech-speak with easily digestible language and useful analogies. The book fits into the category of, "Everything you wanted to know about TCP/IP without getting caught up in the intricate technical details."



Title: *Inter networking with Microsoft TCP/IP on Microsoft Windows NT 4.0*
Publisher: Microsoft Press
Cost: \$149.95

Description: *Covers everything you need to teach yourself how to set up, configure and support TCP/IP on Microsoft Windows NT 4.0 networks. The book comes with a CD-ROM version of NT Server 4.0 and a lesson support CD containing relevant RFCs, white papers on TCP/IP implementation and networked presentations.*

Rating: A

The whole area of TCP/IP is so important that it is the focus of many certification streams. *Inter networking with TCP/IP on Windows NT 4.0* follows exactly the curriculum of the Microsoft Systems Engineer 30,895 course.

However, the book is more clearly written than the course-supplied binder due to its self-study focus. The lesson CD is excellent and well worth the book cost.

The coverage is thorough, entirely practical, and includes how-to information on installation, configuration, and usage of:

- Major TCP/IP utilities,
- IP addressing, subnetting, supernetting,
- IP routing, DHCP, NetBIOS over TCP/IP, HOSTS and
- LMHOSTS file, WINS, browsing, DNS, and,
- LPR, LPD, SNNMP.



Title: *Inter networking with TCP/IP, 3rd Edition*
Author: Kanning S. Simon, Ph.D.
Publisher: New Riders
Cost: \$70.95

Description: *More than a beginner's guide, this book provides the theory behind the TCP/IP protocol more than is not often found in other books.*

Rating: A

Many of the books available today are geared for certification but provide only a cursory discussion of the underlying principles. In large multi-vendor environments, thoroughly understanding the foundational theory is a must. This book provides this necessary background and is required reading for serious network engineers — especially those who support large network installations.

"Inside TCP/IP" includes extensive tables outlining Ethernet types and TCP/IP protocol IDs. The book is particularly strong on protocol field layouts, traces, and analysis of "real world" packet exchanges.

After reading this book, you will feel comfortable with questions such as:

- Is the source routing option, how are the pointer and Offset-length field used to determine if the routing data has been processed?
- How can performing an analysis of the hexadecimal dump of an IP diagram misinterpreted within an Ethernet frame and in troubleshooting?
- How can decoding the contents of the ARP cache table explain the problems when two clients with the same IP address attempt a Telnet session to a central host?
- How can decoding and analyzing sample traces involving ICMP of different types — RST, TCR, UDP and DHCP — help in network administration? ☺

Stephen Barakli is a lecturer, researcher and technical coordinator at Capilano College, and can be reached at sbarakli@capilano.bc.ca. The college and its faculty have ACE, CAPCE, CIPS, Microsoft, Novell, IBM and Intel accreditation and certification.

Korea, IBM will transplant Japanese devices

Sony Corp. and IBM Corp. are now selling a Lotus Notes and Domino doc-enabled multifunction printer, scanner, and fax device in Japan, and plan wide-scale marketing of the offering in North America and Europe in late 1999.

The two companies are also working with about 30 other vendors on the Solution Architecture, an emerging industry standard for common management of printers, scanners, and fax with extensions of enabling the device with compliance to the fax specification, said Jeff Smith of Sony.

Although still more popular in Japan than in other parts of the world, the Solution Architecture is the first specification to extend across printers, scanners, and fax technologies, and to be jointly created by multiple vendors, and Smith.

The Japanese arms of Korea and IBM are currently each handling the Japanese edition of the Document Center from Korea, known as Able, bonded with IBM software called NoOffice, according to Smith. NoOffice is designed to let users scan, photocopy documents from the multifunction device into either Notes e-mail or a server-based Domino doc digital document repository.



New chip recipe at Samsung

Samsung Electronics Co. Ltd. has developed a new process for manufacturing chips that will allow for a 35 per cent increase in performance over comparable chips produced with current technology.

Samsung said it will use the new process to make the next-generation of Alpha processors, which it produces under license from Compaq Computer Corp.

The new production system uses Fully Depleted Silicon on Insulator (FD-SOI), a technology which requires minimal extra design work but makes for significant savings in energy usage and improves signal transmission speed. Samsung said it can be readily applied to existing chips and allows operation on a one volt power supply.

When coupled with a 0.25 micron production process, FD-SOI enables the manufacture of control processors with operating speeds over 1GHz and above. It is also suitable for use with

Sony adds XDA digital still camera

Sony (Tokyo) Co. Ltd. has announced a new XDA-class digital still camera, the DSC-X100, with a one-minute video clip capture feature.

Equipped with a 650,000 pixel charge coupled device pickup, the camera stores images on SmartMedia cards and ships with an 8MB card. Using the supplied cards, users can store 30 images in S-M mode, XGA resolution with a four-fifth compression algorithm, 48 images in S-M mode, XGA resolution with a high-loss compression algorithm, and 173 images in H mode and VGA resolution.

The video capture function records video at 15 frames per second and the supplied card can store 16 seconds in standard mode, 300 by 240 pixels, and one minute in low mode, at 160 by 120 pixels.

The camera, which also features a two-inch liquid crystal monitor and 8.4 lens zoom, will go on sale in Japan on Oct. 16, and carry a suggested retail price of about US\$475. A Sony spokesman said the company is now handling details of overseas sales.

next-generation copper chips and can be used to produce a CPU with operating speeds of 1.2GHz when manufactured using a 0.18 micron process. The system will be applied to next generation Alpha CPUs, and the Karim chip maker.



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Hitachi develops car-capable microcontroller

Hitachi Ltd. has announced development of a single chip microcontroller which features 28 kilobyte on-chip flash memory and a controller area network (CAN) interface.

CAN is emerging as the standard for vehicle (Auto) networks, a Hitachi spokesman said. The system is already enjoying widespread use in Europe and being adopted here by Japanese and American car makers, he added.

The new chip, part of Hitachi's H35, is aimed at the automobile market and is one of the main microcontrollers for a car's dashboard or power steering system. As the heart of the chip is a 93C2800 16-bit control processor core. In addition to the CAN interface and flash memory, the chip also features a data transfer controller and entry to digital converter.

Hitachi says it is now planning additional models with greater memory and other new functions, such as support for body and safety control systems.

Sample production of the chip will begin in December this year, with monthly production set at 5,000 units per month. The chip will cost about US\$16 in sampling. By September 1999, Hitachi wants to increase production to 25,000 chips per month. □



Insurance for Peace of Mind

by Douglas Gray

by
Douglas Gray

It is important to assess your business and personal insurance needs in an ongoing basis, regardless of the type of business that you are operating.

You need protection for the life of the business and the death of the owner. Needs can change in a short time due to changing circumstances. You want to take proactive steps to make sure you are adequately protected. Many business owners are too busy looking after the daily challenges and opportunities of their ventures to spend the time to do so.

Here is a brief overview of some of the common types of insurance to consider:

Here is a brief overview of some of the common types of insurance to consider:

• Liability Insurance

This type of insurance protects the business from legal claims due to negligence, which causes financial or physical injury to the public, customers or employees. For example, manufacturer's product liability is the case of defective products or officer's and director's liability for negligent acts or omissions, and crime and embezzlement liability for those proving adverse. If you were operating out of your home, you would want to have home office extension coverage on your basic homeowner policy. This would be to cover such risks as a customer tripping on your driveway or stairs causing them injury.

• Property Insurance

This would cover damage to your furnishings, equipment or premises due to fire, weather or vandalism, for example. You should also get theft insurance.

• Buy-Sell or Partnership Insurance

If you are in a partnership, you need this type of insurance. It covers a situation where a partner dies and the other partners want to buy out the deceased's interest from his or her estate. The insurance policy will provide the funds to do so. Frequently the insurance policy is held by and paid for by the company. The company therefore receives the insurance proceeds from which it pays out the estate issues relating to partner insurance are covered in a partnership (if non-incorporated) or shareholders (if incorporated) agreement.

• Key Person Insurance

If the key person in a small business dies, it could cause the business to die due to their critical involvement. During the transition stage, someone has to be trained to take over the necessary managerial functions in order for the business to survive. Many businesses don't survive. However, with sufficient life insurance on the key person, there should be sufficient financial buffer to weather the storm, clear off business debts and determine the next steps.

• Business Interruption Insurance

This type of coverage protects you if the business is temporarily unable to continue operating, at the same location, or at all due, for

example, to fire, flood, theft or storm. The insurance would cover loss of income and additional expenses relating to the business disruption until the business can subside its operations.

• Disability Insurance

The risk of having a disability that could restrict your activities increases with age. If you are self-employed, your business income may not be able to be continued if you are unable to be actively involved. However, you have to be careful when selecting this type of insurance, as various policy terms could limit your coverage.

• Term Life Insurance

You should have this type of insurance to protect your family in the event of your demise. That way all your business and personal debts would hopefully be paid off with a large income left for your spouse and children, depending on your individual situation and needs. It is important to have sufficient coverage and monitor changing needs.

• Group Insurance

You can save money on insurance premiums for many types of insurance by obtaining group rates for term life, disability, dental, extended health and product liability, for example. Many associations have group policies available, such as trade associations, chambers of commerce, and merchants' associations.

• Out-of-Country Emergency Medical Insurance

If your business activities involve travelling outside Canada, make sure that you obtain this type of insurance coverage before you depart.

Whatever type of insurance you decide to obtain, get a minimum of three quotes to make sure that the coverage and premiums are consistent. Always pay particular attention to the fine print in terms of exclusions, limitations and deductibles. **JD**

*Douglas Gray, LL.B., is a Vancouver-based expert on small business issues. Formerly a practicing lawyer, he is now a consultant, speaker and author of 16 bestselling books, including *The Complete Canadian Small Business Guide*.*

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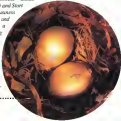
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NEW PRODUCTS

The Zipgy ZipPlus

Image Corp. has announced a new product in its Zip family of portable media products, the ZipPlus (three).

Features that differentiate the ZipPlus from earlier models include: up to 48 per cent faster performance in common functions such as saving and opening files; AutoRecover technology to allow either SCSI or parallel port connections; a compact four-bay power supply compatible with international electrical standards for mobile use; and a range of multimedia software. The software bundle includes Adobe PhotoDeluxe, Web Buddy from Netscape, Image AOL from Digital Arts and Sciences, MacDraw by Picose Works, and RecordIt by Image.

According to Neil Snyder, general manager of the Image Zip after-market business, "ZipPlus has been extremely well-received by our distributors and resellers who have previewed the product. As the Zip drive emerges as the new personal storage standard, it will be increasingly important to offer our customers a range of options with products like ZipPlus."

The ZipPlus is expected to ship with a street price of about \$110.

See <http://imagecorp.com>



Mac has new QuickBooks Pro

Intuit (Sunnyvale, Calif.) has introduced a new version of its QuickBooks financial management software for the Apple Macintosh, just in time to catch the wave of Mac sales associated with the launch of the new Apple iMac.

QuickBooks Pro for the Mac is a fully Canadianized small business accounting package which enables users to track customer contacts, record sales, payables, manage inventory, print system checks and cheques, track time, create custom statements, manage payroll, and track PST and GST.

Bruce Johnson, general manager of Intuit Canada stated: "We're pleased to offer Macintosh small business owners a complete Canadian accounting solution that will help eliminate their accounting headaches. Our research shows that small business owners want easy-to-use software that is flexible enough to meet their individual needs. QuickBooks Pro was designed for business owners who do not want to deal with the hassle of trying to understand accounting jargon or deal with a complex accounting."

The latest announcement of a new Mac version comes a few months after considerable controversy over the apparent selling of many third-party Mac developers' interest in the ongoing Macintosh platform. A new QuickBooks for the Mac is good news for Mac owners who need a computer that is suitable for mainstream business applications, as well as the creative, educational and entertainment-related users that the Mac is famous for. The street price of QuickBooks Pro for the Mac is approximately \$249, and upgrade and component upgrade offers are available for current owners of Mac financial packages. See <http://www.intuit.com>.



Motorola Vanguard handles Voice, LAN integration

Motorola Inc., a Canadian distributor of networking products and services—Rycom Inc., have introduced the new Motorola Vanguard 330 and Vanguard 440 dual-port voice cards, which are devices aimed at integrating voice and data traffic over business networks.

According to Rick Lane, vice-president and general manager of Motorola's Multi-Services Networking Division (MSND), "Voice/data integration is here. The demand for integrated voice/data within today's networks is huge. The response to this feature has been phenomenal, with more than 1,000 units in order from customers who want to support an increasing number of voice over frames relay and voice over IP applications. These customers have proven the benefits of packet voice networks. They are seeing the savings, and they want to extend their capabilities while continuing to serve on long-distance calls."

Handling voice traffic over internet data networks is the Internet as we know it without costs. Internet service providers, for example, often charge customers for connect time. But, this is a paid cost that cheaper than regular long distance rates. While today's Internet phone products have had a certain degree of popularity, they have also been fraught with administrative, offer limited voice quality and aren't a viable corporate solution. Motorola's Vanguard series is designed for professional networks, and provides voice quality and volume capacity that makes it a viable part of a campus network. See <http://www.rycom.ca>.



Fujitsu increases IDE drive capacity

Fujitsu Canada Inc. has introduced its new P1600D 12 and 12H drives, offering up to 16,000 in a three-platter drive. According to Kevin Kozlowski, Fujitsu Canada's marketing manager for storage products, "Fujitsu's new P1600D 12 drives enable us to continue meeting the growing storage capacity and performance demands of desktop systems. Our three-platter design offers users enhanced reliability, 3000 CPM performance and a competitive price point because of fewer drive components." The P1600D 12 model has a list price of \$279 (for the 16,000 model) or \$250 for the 14,000 model. The P1600D 12H model, featuring 7,200 rpm speed, will be released later in the fall. See <http://www.fujitsu.ca>.



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Bay Networks names Canadian GM

The new general manager for Bay Networks Canada is Kenneth McIvor.

He will be responsible for all aspects of the Canadian operations including sales and marketing. He reports to Michael Seltzer, senior vice-president of North American sales.

McIvor has more than 14 years experience in high technology. Most recently, he was regional business manager for Bay Networks Canada.

Coos appoints senior VP

Coos Systems Inc. announced the promotion of Bel Curcio to senior vice-president, in the small-to-medium line of business.

In his new role, Curcio is expected to grow Coos's presence in the small-to-medium line of business through "analog-and Internet solutions and an expanding two-tier distribution model," says the company.

Curcio will report to John Chambers, president and CEO of Coos.

Bel Curcio joined Coos in March 1998 with the acquisition of Precise Software, where he

was co-founder, chairman, and CEO. Prior to Precise, he was co-founder, president and CEO of Network Computing Services Inc., president and CEO of 3Com, and co-founder, chairman and CEO of Bridge Communications, one of the very early network equipment providers. At Coos, Curcio has been leading the Internal Services Management Group, focusing on security policy for several months in the office of the CEO.



Bel Curcio

LandSource adds COO



Patrick Murphy

Patrick Murphy is the new chief operating officer for Toronto-based LandSource Inc., a developer of network communications software.

Murphy has more than 25 years of experience, and has held senior positions with Telematic Electronics Inc., Sansing Electronics Canada Inc., Compucon Labs Inc., Dell Computer Corp., Northern Telecom and Borel.

Teletronics gets new director

Wexford, Ont.-based Teletronics Canada Inc. has promoted Richard McEwen to the position of managing director, replacing Jay Brando who is leaving to "pursue other interests," says the company.

McEwen is now responsible for marketing, sales, service and support in Canada. He reports to Doug Butler, president of the Americas Operations.

McEwen was previously marketing director for the company's wireless test business. The company runs measurement, color printing plus video and networking businesses.

David Marcus takes IBM retail role

Markham, Ont.-based IBM Canada Ltd. has hired David Marcus to lead its new retail computer consulting practice, with the title of managing principal.

Marcus will provide consulting services on business strategy, business transformation, change management, and IT strategy and planning. He has more than 11 years of experience in the retail sales for Most recently, he was an associate partner with Anderson Consulting, where he had responsibility for the retail strategy practice in Canada. He has also held senior positions at management consulting firms and North American retailers.



David Marcus

PeopleSoft announces VP

PeopleSoft, Software Alliance organization will be headed by Robert Eve in the newly created position of vice-president of software alliances.

The company says Software Alliance will work with partners in "define, promote, develop, deliver and support integrated business processes across the enterprise." The group will focus alliance account management, technology transfer, integration development, and certification and customer support.

Robert Eve has 20 years of technology management and operations experience. He has held senior management positions at Oracle Corp., Grand & Hwang and Intel Corp. ■

Calendar

Oct. 6
1998 Technology Information Show
 Toronto, Ont.
<http://www.technologyshow.com>

Oct. 11-15
The Year 2000 Testing, Strategies and Solutions Conference
 Ontario
<http://www.dci.com/techconf/y2kconf/>

Oct. 14
Marketing with the Web
Toronto Forum of Web Developers and Designers
 Toronto
 Fax: \$25
 Oct. (905) 532-1105

Nov. 3-5
The Enterprise Architecture Conference and Exposition
 Chicago
<http://www.enr.com/enterprise/naconf/>

Nov. 8-10
The CRM Summit
 Toronto
 Oct. (416) 220-6633

Nov. 11-13
Comdex/Fall
 Las Vegas
<http://www.comdex.com>

Oct. 4
Computer File Market
 Toronto
 Oct. (905) 871-6025

Oct. 5-5
CIMM Annual Trade Show and Recruitment Conference
 Toronto
 Oct. (905) 338-0000
<http://www.cimm.ca>

Oct. 6 — Halifax
Oct. 14 — Montreal
Marketing '98
<http://www.marketing.com>

Oct. 8-9
Comdex/Power
 Montreal
<http://www.comdex.com>

Do you have an upcoming event you'd like to see listed in CNET's Calendar? E-mail: cal@lapr.com

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Report from Brinkman

Database Server Software: Microsoft, Oracle and IBM Vie for Position

by Margery Leach

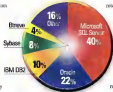
Microsoft's SQL Server dominates the Canadian database server market, according to a recent survey conducted by Brinkman Group Inc.

The Brinkman study polled 300 small, medium and large Canadian organizations across 13 industries and found that Microsoft's product is installed in a larger proportion (40 per cent) of organizations than any other database server. Oracle was in second place at 22 per cent, followed by IBM DB2 at 16 per cent. These findings, which did not vary significantly relative to company size, prove that Microsoft is overcoming the previous market perception that SQL Server was not a high-end enterprise server.

Microsoft is firmly established as the leader in almost all of the thirteen industries polled, with the exception of government, publishing, mining and oil and gas, where Oracle is more firmly entrenched.

But this translates to good news for both Microsoft and Oracle. While Microsoft enjoys the broadest penetration across all industries, Oracle has captured the industries that imply, and therefore purchase, more database servers.

IBM's DB2, which ranked third in terms of number of user organizations, tends to enjoy the highest number of clients per server. Since pricing is based on a per-user licensing fee, IBM is likely realizing solid



revenue despite being installed in a smaller number of organizations.

Microsoft also seems to enjoy the best future prospects, with most respondents indicating future plans to purchase SQL Server than any other product. Still, all of the top three vendors are expected to continue to thrive within their respective market spaces.

Microsoft's competitive pricing strategy is believed to be a key factor in its popularity, while Oracle and IBM enjoy strong reputations for their quality, service and performance. Thus, while Microsoft continues to broaden its base with aggressive pricing, Oracle and IBM will likely build strength and depth by highlighting product and service quality within specific industries.

Keep tabs on the marketing strategies of these three players to see which one does the best job of capitalizing on its perceived advantages. ■

Margery Leach is a director at Brinkman Group Inc. in Ottawa. Brinkman is a leading international "Go to Market" consulting firm with a proven formula for helping organizations in the information technology (IT) industry achieve market success. Call: (613) 743-2262 ext. 119 or fax: (613) 743-6868.

Reader Poll

This Issue:

Our Question to You

Researchers are always looking for better ways for users to communicate with their computers, from more ergonomic keyboards to such futuristic technologies as gesture input. Assuming the technologies progress satisfactorily, what would be your ideal preferred method for most input?

- ☐ I want to input data easily with a pen interface.
- ☐ I want to see a more logical, comfortable keyboard.
- ☐ I want good-quality voice-based input.
- ☐ I'm happy with current input methods.

Last issue, we asked:

In your opinion, how is the currency situation affecting the Canadian computer industry? What most closely reflects YOUR view?

You said:

- 55%** Overall, the currency issues are contributing to costs rising for products and components.
- 6%** Overall, the currency issues are contributing to costs coming down on products and components.
- 15%** On balance, the currency issues are currently having little effect on the Canadian computer industry.
- 25%** There is a missed opportunity for export, with the low Canadian dollar.

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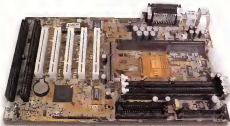
Congratulations to the winner of Microsoft's Office 98 Macintosh Edition, Mark Sussler, owner of Lerner Corp., in Laval, Que.

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Mobile Computing Magazine, '95



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Mobile Computing Magazine, 9-95

D97A (19" CRT)
Innovation '94
Comdex Award Winner!



D97A

D73A (17" CRT)
Best Overall
COM, 5/95
Best Overall
Computer Paper, 7/95

D54 (15" CRT)
Editors Choice
Computer Paper, 5/95

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